# SOUTHERN POWER AND INDUSTRY

OCTOBER, 1750

## In This Issue

#### **85 CASE STUDIES**

Showing how production is being improved in Southern and Southwestern plants through better planning and improved use of modern equipment.

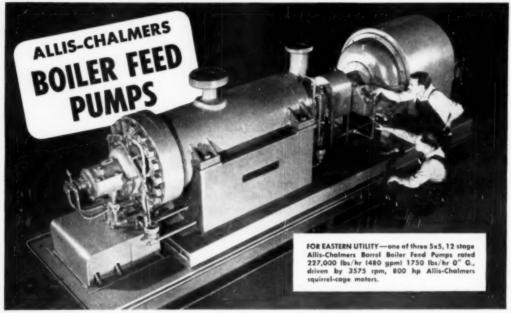
#### **EIGHT SPECIAL SECTIONS:**

Materials Handling
Instruments and Controls
Power and Steam Generation
Refrigeration and Air Conditioning 8
Maintenance and Operation
Power Transmission 9
Piping and Accessories 9
Production Equipment

For Full Table of Contents, See Page 3

Better Production

# A <u>Single</u> Responsibility for Pumping Performance!



Beat this kind of combination at any price: An excellent quality boiler feed pump, high reliability motor, and complete controlall Allis-Chalmers built and backed!

You save time and money in negotiation, installation and operation.

#### ASK THE POWER PLANT USER!

Regardless of which of the 3 Allis-Chalmers boiler feed pumps described at right you finally settle on, here's the kind of maintenance operational record you can expect and get when you invest in A-C:

EASTERN UTILITY, 735 gpm pumps, 'after 45,000 hours no measurable wear on shaft sleeves, rings or internal parts."

MIDWEST UTILITY, 6 x 4, 5-stage pumps, "After 82,000 hours not .001 inch wear on any internal part."

оню uтилту re-ordered three 1800 p.s.i, pumps on strength of this performance - "Only .002 inch wear on rings after 8 years operation on pumps.

And on the motor end, a midwest Utility reports, "in over 20 years of uninterrupted service with three, 800 hp, two-pole motors driving boiler feed pumps we've had to order replacement parts just twice at a total cost averaging less than \$12 a year!"

#### **CHOOSE FROM 3 TYPES PUMPS:**

Barrel-type, for larger steam stations operating against the higher pressures, 1200 to 2500 lbs; 300 to

"Doubleton," for pressures between 1200 and 1800 p.s.i.

Standard Type "M," for pressures usually under 1200 p.s.i.

#### **BENEFITS OF** "PACKAGE" INVESTMENT

Yes, for quality performance in your power plant, get hold of an Allis-Chalmers pump application engineer today. He's an expert at figuring requirements at the economy point. And he's ready to show you where and bow a complete Allis-Chalmers 'Power Plant Pumping Package" ... pumps, motors, control, will keep you ahead in time, performance, and freedom from worry.

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Volume 68

Number 10

Handle Bulk Materials by



Mechanical VIBRATION

with the JEFFREY

It's New. Handles all kinds of bulk materials - dry or wet, hot or cold, fine or coarse. abrasive, lumpy or rough. Operates on a system of balanced forces (natural frequency) - mechanical instead of by electric impulse. Large power savings.

This NEW Jeffrey MV Conveyor conveys chemicals or food products horizontally, downhill or uphill as steep as 10°. The V-belt drive unit with a floating eccentric shaft will operate two equal lengths of conveyor sections up to 80 feet. May be floor or suspension-mounted — open, closed or tubular decks. Vibration is isolated to the machine itself. Bulletin No. 826 goes into detail.

(Patent Pending)

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Complete Line of Material Handling, Processing and Mining Equipment





IR and water are bound to get into turbine oil. When ordinary oils are used, oxidation speeds up, rust and sludge are likely to form – particularly if the oil has a tendency to foam. To avoid these trouble-makers, use Texaco Regal Oils (R&O).

In making the world-famous Texaco Regal Oils (R&O), the choicest base stocks are first refined into top-quality straight mineral turbine oils; then further improved by additives to inhibit rust and oxidation, and specially processed to prevent foaming. This extra care pays off in extra protection for your turbines.

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Let a Texaco Lubrication Engineer show you specifically how your turbines and auxiliaries can benefit from the use of Texaco products. Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 E. 42nd St., New York 17, N.Y.



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TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE on television every Tuesday night. See newspaper for time and station.

# SOUTHERN POWER AND INDUSTRY



ANNUAL
BETTER PRODUCTION
ISSUE

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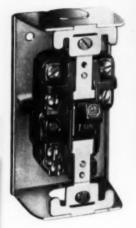
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Editorial and Executive Offices: SOUTHERN POWER & INDUSTRY, 806 PEACHTREE ST., N. E., ATLANTA 5, GEORGIA

## TROUBLE FREE MOTOR STARTERS





# with RELIABLE OVERLOAD PROTECTION

# For Fractional Horsepower Motors

The National Electrical Code requires overload protection for all fractional horsepower motors started automatically or by remote control. The Bulletin 600 switch satisfies this need. Its dependable, accurate, thermal breaker trips the switch under a sustained overload, and protects the motor against burnout.

QUICK MAKE AND BREAK CONTACTS-The simple, rugged, over center mechanism provides quick make and quick break contact action . . . therefore, long contact life.

GENEROUS WIRING SPACE-Though compact, this small switch provides plenty of wiring space. Its metal cover slips off, exposing front and two sides.

EASY TO INSTALL-No need to remove the starter from the enclosure during installation - saves at least 10 minutes of installation time.

ATTRACTIVE APPEARANCE—This starting switch, with its clean, modern lines, is a sales asset to any motorized machine.

> Allen-Bradley Co. 1328 S. Second St., Milwaukee 4, Wis.



For watertight or weatherproof jobs - with pilot light.



Cast iron - for hazardous gas.



Three way "Hand - Off -Automatic" selector switch,





Bulletin 600 starting switch Available in various enclosures



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# Facts and Trends

#### FOR SOUTHERN INDUSTRIAL AND POWER EXECUTIVES

October, 1950

MORE AND BETTER PRODUCTION in relation to power equipment calls for something besides preventive maintenance. We are too quick to pass along to the master mechanic a demand for complete preventive maintenance without providing him the tools and facilities necessary. Transformers, switchboards and power feeders cannot operate forever under present conditions of rising production with consequent rise in power consumption.

On the other hand, management cannot be expected to produce out of thin air with little or no notice the necessary funds to modernize electrical equipment. Such programs are usually quite expensive and are best tied into overall plant modernization or expansion plans. It is a wise engineer who makes his plans ahead and knows what he wants before management is ready to act.

- MORE AND BETTER PRODUCTION by increased power reliability as reported by Robert J. Tucker, Jr., Plant Engineer of Roanoke Mills Company of Roanoke Rapids, N. C., will be featured in an early issue of SP&I. This company recently completed an extensive modernization of its primary power equipment which provides one practical application of the points brought out above.
- MORE AND BETTER PRODUCTION by "Powering Up" is also being stressed in an extensive industry-wide campaign of Anaconda which calls industrial plant engineers' attention to the fact that 9 out of 10 plants are suffering power loss and profit loss because of overloaded wiring. Obsolete wiring wastes money through production interruptions or slow-downs, lost manhours, and through damage to equipment. Anaconda Wire & Cable Company offers a copy of POWER-UP AND BE PREPARED to industrial and power plant engineering personnel.
- MORE GAS TURBINE POWER PLANTS, similar to the 3500 kw (4800 hp) simple-cycle type now operating at Oklahoma Gas & Electric Company's Huey Station, are now in large scale production at G.E. for land, railroad, and marine use. Twenty units are scheduled to be built within the next two years in three basic models: 3500 kw simple-cycle type, 5000 kw two-shaft compound-cycle type for power generation use and a newly designed 5000 hp two-shaft mechanical-drive type for gas pipeline and other applications.

The OG&E installation was the first gas turbine-generator unit to be operated by a power company in the United States and has to date produced more than 26 million kw hrs. Design data on this installation was carried in the December '48 issue of SP&I and an extensive 4200 hour service report in the June, 1950 number.

- MORE SOUTHERN NEWSPRINT from Southern pine is a strong possibility with plans now under study to build a \$40 million newsprint and kraft paper board mill near Butler, Alabama. Output would be approximately 100,000 tons of standard newsprint and 100,000 tons of kraft board. This would be the third newsprint plant in the South supplementing large facilities at Lufkin, Texas and Childersburg, Alabama.
- MORE STEEL PIPE FOR THE SOUTHWEST -- the \$5 million A. O. SMITH CORPORATION of TEXAS plant at Houston has reached a monthly production capacity of approximately 40,000 tons of large diameter welded steel pipe. Steel is manufactured by Sheffield Steel Corporation from East Texas iron ore, Central Texas limestone, Oklahoma coal, Texas natural gas and scrap largely purchased in the Gulf Coast region. CONSOLIDATED WESTERN STEEL at Orange, Texas, geared for 50 miles of electrically welded and hydraulically expanded steel pipe a month has met this goal every full month of production since it opened last April.

- MORE POWER FOR THE SOUTHEAST -- A third 45,000 kw generating unit will be installed at CAROLINA POWER & LIGHT COMPANY'S Lumberton, N. C., plant -- a third 100,000 kw generating unit at Plant Yates, the GEORGIA POWER COMPANY'S new steam-electric power plant near Newman, Georgia will cost approximately \$10 million -- two new 40,000 kw generators are scheduled for FLORIDA POWER CORPORATION, one for the Avon Park plant and the other for the new Booth plant near St. Petersburg. Latter is designed for an ultimate capacity of 120,000 kw.
- MORE RECOGNITION FOR HOUSTON, TEXAS as the largest city in the South and 14th largest in the nation. Preliminary U. S. Census reports give Houston 593,600 followed in the South by New Orleans, Dallas, San Antonio, Memphis, Louisville, Atlanta, Birmingham, Ft. Worth, Miami, and Oklahoma City.
- MORE NYLON PRODUCTION IN THE SOUTH with du Pont adding 100,000 sq ft for spinning, inspection, and shipping at their Martinsville, Virginia plant. Completion scheduled for 1952. The company is also expanding their Chattanooga yarn plant and the world's first plant at Seaford, Delaware. Construction is also under way on a new plant for the production of nylon salt at Victoria, Texas. Du Pont's other Southern operation at Orange, Texas has been producing "nylon salt" since 1946.
- MORE AND BETTER FINISHING PLANT PRODUCTION at the Kerr Bleaching & Finishing Works, Inc., Concord, North Carolina as reported by W. H. Fisher, Plant Engineer will be featured in the November issue of SP&I. An old steam plant with 9 HRT boilers was shut down and replaced with a new B & W unit rated at 60,000 lb/hr continuously, and 70,000 lb/hr for a 2 hour peak. RESULTS: 50 per cent increase in capacity in 46 per cent floor space, 67 per cent savings in labor, and 40 per cent savings in fuel.
- INSTRUMENTATION CONFERENCE FOR THE SOUTHWEST -- Sponsored by Texas A & M, their fifth symposium on INSTRUMENTATION FOR THE PROCESS INDUSTRIES, October 11 13 at College Station, Texas. Course will be conducted as a seminar with lectures and discussions on measurement and control of temperature, pressure and liquid level, time control, and other allied subjects. \$5 registration fee. Write Chemical Engineering Dept., Texas A & M College, College Station, Texas.
- CHEMICAL CONFERENCE FOR THE SOUTHEAST -- Sponsored jointly by the American Chemical Society and the Southern Association of Science and Industry, a SOUTHERN CHEMICAL CONFERENCE, October 16 18 in Atlanta, Georgia. Program speakers: E. H. Volwiler, National President of ACS and President of Abbott Laboratories; L. S. Roehm, Dir. of Technical Dev., Dow Chemical Company; and Sidney Kirkpatrick, editorial director of Chemical Engineering. Special technical sessions and reports on opportunities for plastics industries, expansion of petroleum industries, quality control in food and drink industries, and development of new chemical products from Southern raw materials. Obtain program information from SASI Headquarters, 5009 Peachtree Rd., Atlanta, Georgia.
- EQUIPMENT AND METHOD TRENDS -- Aid to BETTER HANDLING is the GUIDED PALLET. Steel channel in center of conveyor frame provides a guide-way for a small wheel bolted to the underside of each pallet, preventing shifting in transit. Power units and gravity sections that bolt together like an Erector set allow plant workers to install and rearrange the Rapids-Standard system to fit production needs.

Glass-fiber tube and PIPE MATERIAL, called Glasweld by U. S. Plywood, is available as piping in the chemical processing industry and as tubing for the building, electrical, and allied fields. Rust and corrosion proof non-metallic product possesses good electrical properties.

New PRESET SPEED DEVICE for G.E.'s a-c adjustable-speed motor eliminates expensive control equipment. Predetermined speed can be set manually by a knob either directly on the motor or at the end of a flexible cable. A pilot motor is actuated by the mechanical follow-up control so that on successive starts it automatically drives the motor brushes to a setting corresponding to the speed set on the adjustable knob.

Write the editors for additional information on any of the above items. SOUTHERN POWER & INDUSTRY 806 Peachtree St., N.E. Atlanta 5, Ga.



## to LUNKENHEIMER STEEL VALVES?



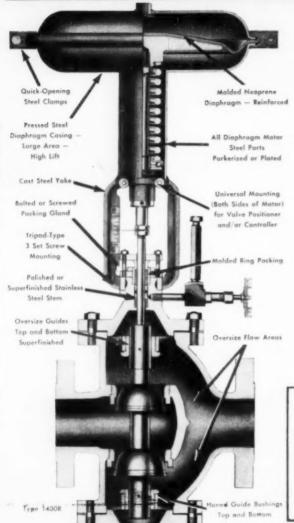
Well, there are "alternates." But the engineer's familiar specification, "Lunkenheimer Figure 1938 or equivalent," invites a comparison with your thumbprint and your neighbor's. How "equal" can valves really be? A few characteristics can almost be matched. But there is no equal for most Lunkenheimer features. Consider the metal quality of Lunkenheimer steel castings. Their soundness is unparalleled in the valve field. Lunkenheimer metallurgical research has uncovered whole new areas of study, developed exclusive alloys, pioneered in methods of quality control. The amazing records of safety and long service life achieved by Lunkenheimer steel valves are evidence that there is no real equivalent for Lunkenheimer metal quality. In workmanship, too, the famous Lunkenheimer tradition of care and precision has never been equalled. New machines (most of Lunkenheimer's machinery is less than three years old) are making possible even bigher standards of workmanship. The only equivalent to a Lunkenheimer steel valve is another of the same design -a Lunkenheimer. For the address of your nearest representative, and for more steel valve data, write to The Lunkenheimer Co., P. O. Box 360C, Cincinnati 14, Ohio.

STEEL...IRON...BRONZE

LUNKENHEIMER
THE ONE GREAT NAME IN VALVES

L-950-9 A

# ADVANCED-TYPE VALVE FOR EXACTING CONTROL



K & M Diaphragm Control Valves embody the accessibility and other desirable features of the "open yoke", formerly available only in cast iron construction, together with the strength and resistance to shock found only in steel.

The diaphragm casing assembly is the exclusive K & M Boltless Duoseal design which allows quick disassembly. The large diaphragm is molded so there is full effective contact with the diaphragm button during the complete valve stroke. This construction, together with heavy, calibrated, long-travel springs gives an unusually high power factor for extremely precise control.

Flow passages of the valve body have a minimum average area of 140% of comparable size pipe area; inner valve open free areas average 80% of pipe area. This design permits pressure drop to take place principally through the inner valve, assuring complete control over the full valve stroke.

Send for K & M Bulletin S10 for details and data.

#### K&M SERIES 1200 and 1400

Available sizes — 1/2 to 16 inches.

Construction — Cast iron, carbon and stainless steels and most ma-

chineable alloys.

Inner Valves — A wide range of styles and characteristics to meet varying requirements.

Action — Designed for direct or reverse action.



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Established 1879

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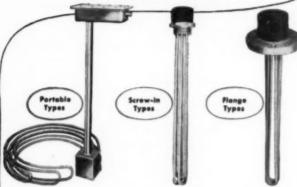
NORTH BERGEN, N. J.

the modern & & A in the includes Disphragm. Control Yelves, Liquid Lovel Controls, Pressure Plain and related equipment for steam, gas, sir, all and liquid service. Ask for & & M istologue 47.

### CHROMALOX

#### **Electric Immersion Heaters**

for Heating Water, Oils
Waxes, Heat-Transfer Mediums
and other Liquids

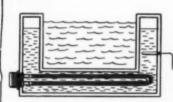


#### Look to CHROMALOX for Dependable Electric Heat

CHROMALOX Electric Immersion Heaters come in a full range of types for permanent or portable use. They are quickly and easily installed with minimum labor and material costs... and they may be manually or thermostatically controlled for accurate, care-

free, dependable operation. Available in types and sizes to fit your needs in iron, steel or alloy sheaths to resist corrosion.

If you are interested in heating liquids efficiently, or if you have any other heating problem—you are invited to consult CHROMALOX.



#### a Typical application

Indirect immersion heating with Chromalox Electric Tubular Heaters.

OTHER UNITS AVAILABLE FOR HEATING:

Water, esphalt, greases, molten salts, pickling baths, Dowtherm, Arector, Prestone—for superheating steam and compressed air—for melting lead, solder, babbit and stereotype metal.

#### CHROMALOX

offers you the most in

**Electric Heat** 

#### Experience



33 years experience in electric heating, covering almost every industrial process employing heat up to 1000F

#### Selection



Over 15,000 types, sizes and ratings to fit most every application requiring heat

#### Service



135 field engineers in 37 cities throughout the country, to give you on the job counsel and assistance.

#### Engineering



Application engineers working with research, develupment and manufacturing personnel provide technical know-how for solving «Sdustrial heating problems

FOR COMPLETE INFORMATION Write for Cutalog Sal which describes the complete Chromalus facilities and products designed to most your hasting requirements.

EDWIN L. WIEGAND COMPANY

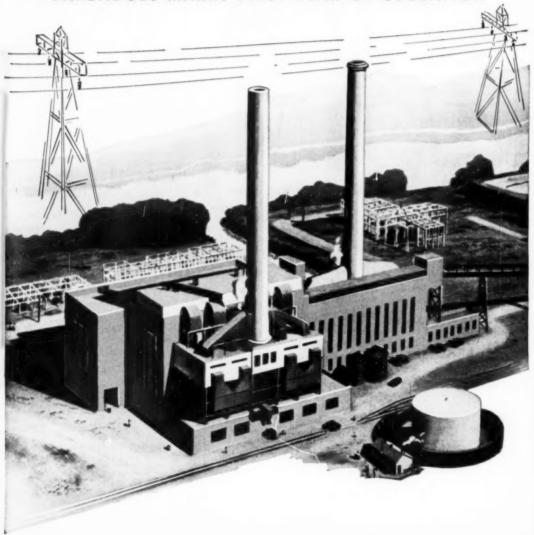
### CHROMALOX

Electric Heat for Modern Industry.

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# running lines into the future

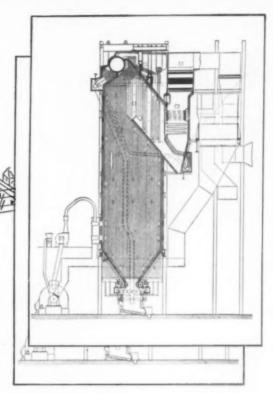
BARBADOES MARKS FIRST YEAR OF OPERATION



Two FOSTER WHEELER steam generators supply steam for the new turbines at BARBADOES STATION of PHILADELPHIA ELECTRIC COMPANY.

Steam Capacity per Unit 600,000 lb per hr Superheat Control Range 330,000 to 600,000 lb per hr Pressure Superheater Outlet 825 psi **Final Steam Temperature** 

nous Coal Pulverized in FW Ball Mills (two per unit)





The growth in the supply of electric power keeps pace with the rising population and productivity of Philadelphia's highly industrialized Schuylkill Valley since two 66,000kilowatt turbo-generator units were installed a

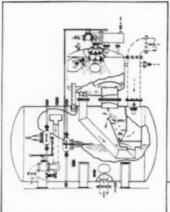
year ago in the \$24,000,000 expansion of the Philadelphia Electric's Barbadoes Station. This station, which has a total capacity of 180,000 kilowatts - enough for the needs of 500,000 homes - is part of the Company's electric system covering an area of 2,255 square miles and serving more than 900,000 customers.

A total of 1,200,000 lb of steam per hr is supplied to the new turbo-generators by two. Foster Wheeler Steam Generators which have a performance record proving the advantages of such Foster Wheeler design features as slagfree furnace arrangement, low draft loss, and efficient heat recovery arrangement. Each unit is fired by two Foster Wheeler Ball Mill Pulverizers with facilities to permit full load operation with coal or gas.

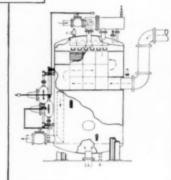
The most advanced techniques permit the handling of 12,000 tons of coal, 30,000,000 pounds of steam and 250,000,000 gallons of water each day at Barbadoes. Only 11 men per shift are required to operate the two new units and steam generators.

# FOSTER W WHEELER









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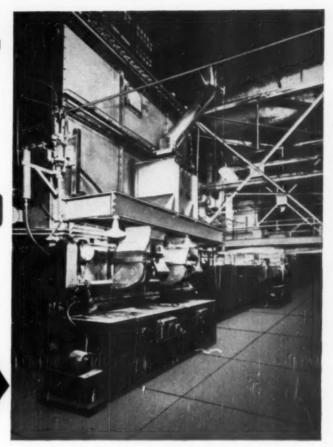
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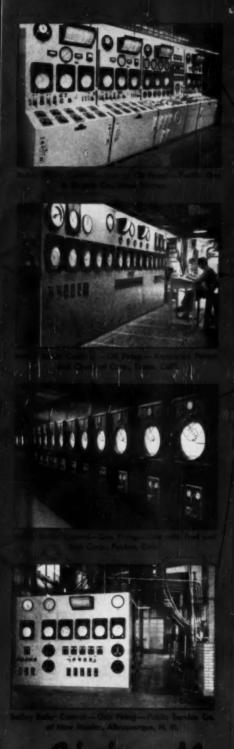
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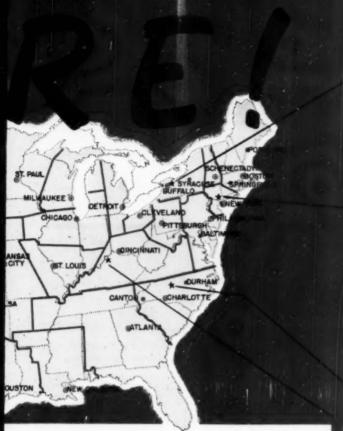
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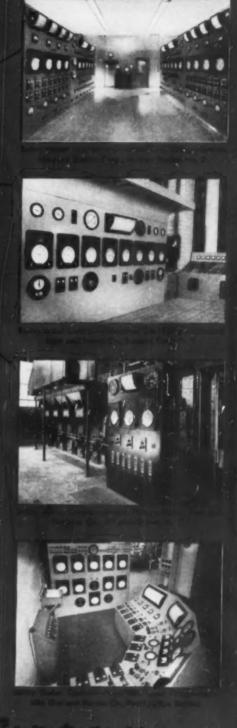
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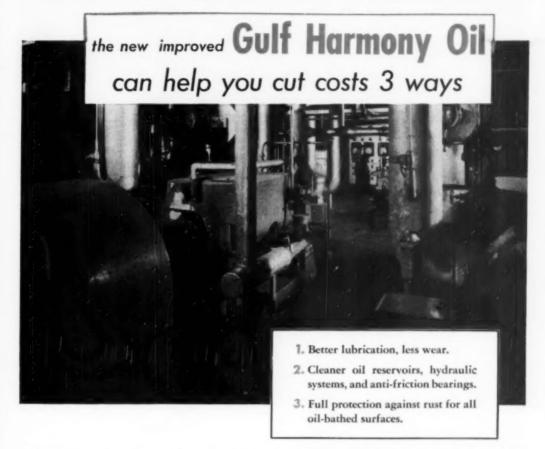
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This outstanding oil provides more effective protection for bearings, gear units, hydraulic mechanisms and compressor cylinders. Available in a wide range of viscosities.

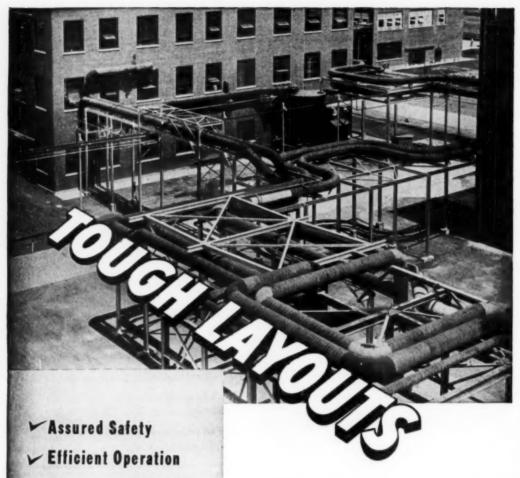
For more complete information on Gulf Harmony Oil, call in a Gulf Lubrication Engineer today. Write, wire, or phone:

#### **Gulf Oil Corporation · Gulf Refining Company**

GULF BUILDING, PITTSBURGH, PA.

Sales Offices - Warehouses

Located in principal cities and towns throughout Gulfs marketing territory



- V Minimum Fuel Costs
- ✓ Low Maintenance
- Long, Trouble-Free Life

## MADE SIMPLE BY NAVCO

The high degree of skill acquired by Navco Engineers from long experience in solving unusual Piping problems is your guarantee of an accurate and workmanlike Piping System.

Consult Navco for your next Piping Job



NATIONAL VALVE & MANUFACTURING COMPANY - PITTSBURGH, PA.

NEW YORK . CHICAGO . CLEVELAND . BOSTON . ATLANTA . TULSA . BUFFALD . CINCINNATI



Bronze, call the leading Distributor in your community—because—the leading Distributor in your community is, almost certainly, the Bunting Distributor. The Bunting Brass & Bronze Company, Toledo 9, Ohio.

Branches in Principal Cities.



PRECISION BRONZE BARS

BUSHINGS

77

# Every HOT wire



The right cable for the job

# costs you cold cash

# It's 9 to 1 your wiring is overloaded!

IT'S TRUE! Actually 9 out of 10 plants, today, are suffering power loss and profit loss because of overloaded wiring.

Chances are it is happening to you!

**PRODUCTION SLOW-DOWNS**, lost man-hours, electrical leaks through over-heating are all results of poor plant wiring... wiring that just can't deliver the power you pay for—day in, day out.

**POWER UP**—And Be Prepared before a breakdown occurs, before inadequate wiring blocks

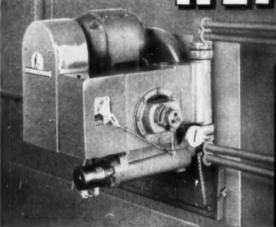
expansion. Call on your consulting, utility, plant power engineer, or electrical contractor for a complete check-up.

AND, MOST IMPORTANT OF ALL, write for your free copy of POWER UP—And Be Prepared! This complete guide to wiring will show you how simple alterations now will save you money every day—and huge repair bills later!

Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.



# IBON FIREMAN precision firing with IEANY OLL



IRON FIREMAN HORIZONTAL ROTARY OIL BURNES

NO. 6 OR LIGHTER

Oil feed rate stays within ½ of 1% of setting, regardless of oil temperature or viscosity

# America's most advanced burner for firing heavy fuel oil

The Iron Fireman horizontal rotary oil burner completely eliminates the troublesome viscosity factor in firing heavy oils. Oil-flow to nozzle is steady and uniform, metered with extreme accuracy by the Iron Fireman Oil Volumeter which is wholly unaffected by viscosity changes.

This makes possible the highest degree of precision in flame control attained in heavy oil firing. Perfect synchronization of oil and air volume produces efficient combustion, even when throttled down to 10 per cent of capacity.

Every detail of this superb burner has been engineered with extreme care. Oil and air passages have been

carefully designed to assure efficient operation with low power consumption.

For further information write to Iron Fireman Mfg. Co., \$249 W. 106th St., Cleveland 11, Ohio. Other plants in Portland, Oregon; Toronto, Canada, Qualified dealers throughout the U. S. and Canada.

#### IRON FIREMAN OIL VOLUMETER

The Iron Fireman Oil Volumeter is a positive displacement, variable volume metering pump, completely submerged in the oil reservoir. It meters oil to the nozele by regulating the stroke of its multiple pistons. No regulating valves or viscosity compensating device is required.

#### SYNCHRONIZED OIL-AIR CONTROL

Single control lever regulates oil, primary and secondary air. Correct fuel-air ratio maintained automatically through entire firing range. For manual, semiautomatic or full automatic operation.

#### FOUR-PORT HINGE POST

Permits installation of hot water or steam oil heater in oil line on pressure side of burner pump. No suction pumping of hos oil to form vapor locks.

#### OIL-GAS-COAL COMBINATION

Iron Fireman ring-type gas burner and pneumatic spreader stoker combine perfectly with rotary oil burner. Fuel change is accomplished in a short time without major alterations. Protects your plant against high fuel prices or shortages. Impartial Iron Fireman survey will help you determine which fuels are best fitted for your operation.



fedders )

for Maximum Output with Minimum Cost

Fedders advanced design and high efficiency provide the most economical heating unit from every standpoint of easy installation, quick response to manual or thermostatic control and fuel savings. Made in a complete range of well-graduated sizes in horizontal and downblow types.

Write for name of your local representative.

FEDDERS-QUIGAN CORPORATION

BUFFALO 7, N. Y.

You get these

5 BIG

**ADVANTAGES** 

with
Ingersoll-Rand
MOTOR PUMPS

1

#### COMPACT DESIGN

Ingersoll-Rand Motorpumps are ruggedly built with motor and pump combined in one unit with a single shaft. Saves space; eliminates vibration.

2

#### **OPERATE IN ANY POSITION**

These pumps operate efficiently whether mounted horizontally, vertically or at any angle. This means that it can be bolted to floor, wall, ceiling, tank or column, whichever is most convenient.

3

#### OVERSIZE SHAFT

This insures minimum shaft deflection, a smoothrunning impeller, and eliminates many packing troubles. Shaft protected against wear and corrosion by shaft sleeve.

4

#### **DEEP STUFFING BOX**

All heavy-duty Ingersoll-Rand Motorpumps have space for 5 or more rings of packing and a sealing gland. A needle valve provides exact control of the sealing liquid. Mechanical Seals are available on integral hp units and standard on fractional hp units.

5

#### OVERSIZE BEARINGS

Larger radial and thrust capacity than bearings in a standard motor. Also protected from dust and dirt by cartridge type housings.



Available in sizes from  $\frac{3}{4}$  to 40 hp. Capacities from 10 to 1800 g.p.m. Heads up to 600 ft.

# MOTOR PUMP

Get in touch with us for more complete information or for any help you need in solving your pumping problems.

Ingersoll-Rand



Each of these B&W Refractories is a "specialist." Each is designed to do a particular job under specific furnace conditions. This complete line of B&W Refractories is the result of years of practical research and development in the refractory field. That is why your B&W Refractories Representative can make expert unbiased recommendations to solve your individual problems and assure profitable, efficient furnace operation.

#### HEAVY FIREBRICK

For furnaces with slagging, flame impingement and spalling conditions, either B&W 80 or Junior Firebrick can be used. 80's assure uninterrupted service at extremely high ratings. Juniors are recommended where load bearing and temperature requirements are less severe, but too severe for the best grades of fireclay brick.

#### IMSULATING FIREBRICK

B&W Insulating Firebrick have the lightest weight and lowest heat conductivity of any insulating firebrick in their class. They store and conduct less heat — withstand direct exposure to furnace gases. Available in six types for temperatures from 1600 F to 2900 F.

#### PLASTICS

Used widely for repairs and for forming special shapes in place, B&W Plastic Moldable and B&W Plastic Chrome Ore offer

long life under severe conditions. Plastic Moldable is suitable for use in the great majority of furnaces. It withstands temperatures up to 3000 F. Plastic Chrome Ore is ideally suited for severe slagging conditions.

#### CASTABLES

In furnaces that require the high resistance of chrome to chemical attack and where speed of installation is important, B&W offers Kromecast for temperatures up to 3100 F and Hydrochrome for temperatures up to 2800 F.

For burner openings, door linings, walls, roofs and arches, B&W Kaocast possesses unusual volume stability and resists spalling. It easily withstands temperatures up to 3000 F.

B&W Baffle Mixes are excellent castables for the construction of monolithic boiler baffles, door linings and other general uses. They are smooth and flow easily, have high strength in small sections. Widely used to withstand temperatures as high as 2600 F.

B&W Insulating Concrete Mixes combine refractoriness, light weight and low heat conductivity with the ability to be poured like ordinary concrete. For temperatures up to 2200 F.

#### MORTARS

B&W Mortars — Selecting the right mortar is vitally important to long refractory life. B&W Mortars pay for themselves by saving time in application and by satisfactorily performing their jobs under the designed furnace conditions.

When relining your boiler furnace, call in a B&W Refractories Engineer. He will be glad to recommend the type of refractory best suited to your needs.

8-312



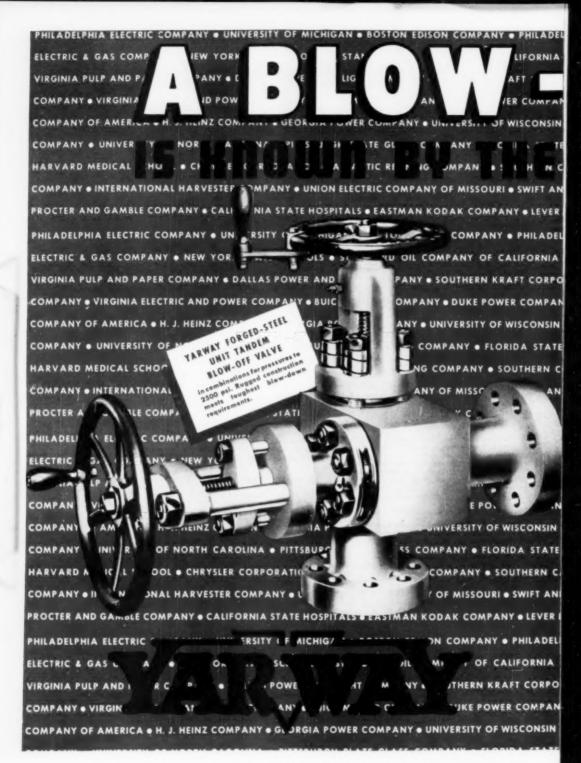
#### **BAW REFRACTORIES PRODUCTS**

BAW 80 FIREBRICK - BAW JUNIOR FIREBRICK
BAW 80 GLASS TANK BLOCKS - BAW INSULATING FIREBRICK
BAW REFRACTORY CASTABLES, PLASTICS AND MORTARS

#### CITHER BAW PRODUCTS

Stationary & Marine Boilers and Compenent Equipment Chamical Recovery Units . . Seamless & Welded Tubes . . . Polverizers Fuel Burning Equipment . . Pressure Vessels . . . Alley Castings







When buying blow-off valves, weigh the significance of these two facts:

More than 15,000 boiler plants in the United States and other countries are equipped with Yarway Blow-Off Valves... Some of them for nearly 40 years. Among high pressure plants, 4 out of every 5 in the United States are Yarway-equipped.

Design, metallurgy, workmanship and service are the reasons. It was Yarway that brought out the famous Seatless Valve, teamed it with a stellited hard-seat valve in a common forged-steel body to make the popular Unit Tandem. Yarway has also made avail-

able metallurgical improvements to withstand the chemical reactions of acid wash as well as the mechanical wear of boiler blow-down.

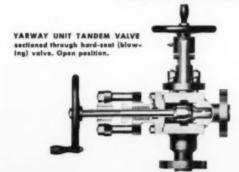
Yarway continues to pioneer and improve blow-off valves and blow-off valve service for both high and low pressure applications.

On new boilers, replacements or modernization, make sure you specify Yarway Blow-Off Valves. Any boiler manufacturer will supply them on your specification.

Bulletin B-424 gives you the full story on pressures to 400 psi. Bulletin B-433 for higher pressures. Both are free, Write...

#### YARNALL-WARING COMPANY

Home Office: 116 Mermaid Ave., Philadelphia 18, Pa. outhers Representative: ROGER A. MARTIN, Bana Allon Building, Atlanta 3, Ga.



YARWAY UNIT TANDEM VALVE sectioned through sectless (seeling) volve. Open position.





#### AT PHILIP SPORN PLANT\*:

# DIAMOND AUTOMATIC SEQUENTIAL **SOOT BLOWING SYSTEM provides** correct cleaning at minimum cost

The "human element" is eliminated from boiler cleaning by the Diamond Automatic Sequential Soot Blowing System. All blowers operate in proper sequence and at correct blowing speed every time . . . no blower can be overlooked or incorrectly operated by a careless operator. In addition to improved cleaning, there is a saving in labor as an attendant is not required by automatic operation.

At Philip Sporn Plant, Diamond Soot Blowers of various types are used according to furnace location and service required. All blowers are controlled by the control panel shown at the right. To do the complete blowing job the control room operator merely moves a lever. The control panel takes over . . . operates each blower or group of blowers correctly and in turn. On completion of the blowing cycle the panel automatically shuts off. For further information on the many advantages of Diamond Automatic Sequential Soct Blowing Systems, ask for Catalog 1014.

DIAMOND AUTOMATIC SEQUENTIAL AIR CONTROL

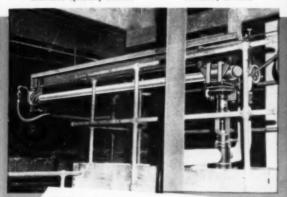


\*Part of the American Gas and Electric Company System.

#### DIAMOND POWER SPECIALTY CORP. LANCASTER, OHIO

Diamond Specialty Limited

Windsor, Ontario



DIAMOND MODEL IK LONG

RETRACTING SOOT BLOWERS



DIAMOND TELESCOPIC LONG RETRACTING SOOT BLOWERS

4271-B

## Keep heat and heating costs from

# "HITTING the

THIS WINTER, why not see that you get all the heat you are paying for? Let Thermolier Unit Heaters bring both your heat—and your heating costs—down to a reasonable level.

HEATING COMPORT Thermolier Unit Heaters provide quick heating from a cold start. Desired temperatures are easily maintained within a close range. Heat is uniformly distributed in the working zone by forced air circulation. It is a very flexible system because different or changing heating requirements are easily satisfied by means of different models, a range of capacities, single—or two-speed motors and individual thermostatic controls.

LOW FIRST COST Thermolier Unit Heaters are so efficient and so compact that their heating capacity is often equivalent to the capacity of cast iron radiation or pipe coils of twice the cost. Additional savings are effected because the system requires a proportionately smaller amount of pipe, fittings and accessories.

**ECONOMY OF OPERATION** Heat is forced down to the working level . . . not banked uselessly at the ceiling level. Heat is turned on and off merely by throwing a switch either manually or automatically by simple thermostatic controls. The rapid response means that heat is furnished only when and where it is wanted . . . no heat is wasted.

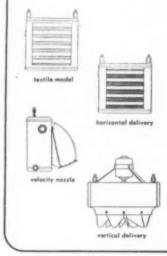
ADAPTABILITY TO EQUIPMENT AND FLOOR LAYOUT Thermolier Unit Heaters are widely used in industrial plants and warehouses, garages, stores and public buildings. The units and the simple piping are overhead where they do not interfere with arrangement of operating machinery or equipment and do not take up valuable floor or wall space. Units are easily relocated at any time to meet changes in layout.

THERMOLIER UNIT HEATERS HAVE IMPORTANT CONSTRUCTION ADVANTAGES The design of Thermolier Unit Heaters is the product of Grinnell Company's 100 years of heating experience. Heating experts like Thermolier's dependable operation, freedom from maintenance troubles and durability. Typical of its construction features is the patented internal cooling leg which permits the use of a plain thermostatic trap, the simplest, least expensive kind of a trap. Other features are built-in drainage, continuous rated capacity and provisions for expansion of U-tubes.

Get in touch with Grinnell or your local Thermolier distributor.



There is a type and capacity of Grinnell Thermalier for maximum heating results under every condition.



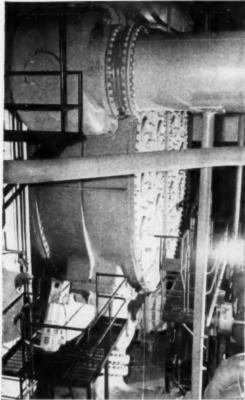


**GRINNELL** 

THERMOLIED UNIT HEATERS

Grinnell Company, Inc., Providence, R. I. Branches: Atlanta \* Billings \* Buffalo \* Charlotte \* Chicago \* Cleveland \* Cranston \* Fresno \* Kansas City \* Mousten \* Long Beach
Los Angeles \* Milwaukee \* Minneapolis \* New York \* Oakland \* Philadelphia \* Pacatella \* Sacramento \* St. Louis \* St. Paul \* San Francisco \* Soottle \* Spotane

# "SELF-CLEANING" CONDENSER Eliminates 2 to 3 HOURS Daily Down-time



HERE'S HOW THE "REVERSE FLOW" PRINCIPLE WORKS ->

Both halves of this Dual Bank Condenser work the same but independently of each other.

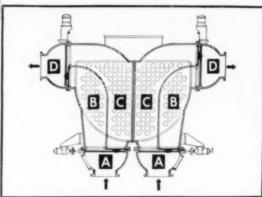
Left Side: Water enters divided water box at valve chamber A, with left port open. It flows through pass B to end of condenser, back through pass C and out through upper port of D.

Right Side: Flow is reversed: Valves at inlet A and discharge D are changed to permit water to flow through C and back through B in the opposite direction, then out through lower port of D. At Plant Atkinson, Harryat, Georgia, the Georgia Power Company draws circulating water from the Chattahoochee River. The inevitable sand, gravel, twigs and leaves used to clog condenser tubes and tube sheets in a matter of hours. Before the installation of a C. H. Wheeler Reverse Flow "Self-Cleaning" Condenser, it was a two- to three-hour job every day to remove anywhere from ½ to 2 yards of debris by hand. During this time, it was necessary to drop the load on the turbine to about half in order to operate against excessive back pressure.

Since September 5, 1949, when a C. H. Wheeler "Self-Cleaning" Condenser was installed, there hasn't been a single shut-down for cleaning. The Reverse Flow mechanism works flawlessly 24 hours a day, with 70,000 gallons per minute of river water passing through. The only cleaning is done by means of the electrically operated valves that reverse the flow of water through the condenser without interfering in any way with plant operation. This is done as often as necessary in a matter of minutes.

Through eliminating down-time for condenser cleaning, approximately *one month* of full capacity operation is added to the service of one of the four 60,000 KW turbo-generators in this 240,000 KW plant.

You, too, can benefit by C. H. Wheeler Engineering. Whether or not you need the self-cleaning Reverse Flow feature, it will pay you to "Investigate C. H. Wheeler Condensers before you Invest."



STEAM CONDENSERS—STEAM JET EJECTORS—COOLING TOWERS—VACUUM REFRIGERATION—HIGH VACUUM
PROCESS EQUIPMENT—MICRO-PARTICLE REDUCTION MILLS—MARINE CONDENSERS & EJECTORS—DECK MACHINERY

C. H. WHEELER MANUFACTURING CO., 1804 SEDGLEY AVE., PHILADELPHIA 32, PA.

REPRESENTATIVES IN MOST PRINCIPAL CITIES

For complete story on this installation, see editorial on page 78

A DIESEL ENGINE is no place to test lubricants. For unless the lubricant is specifically engineered for the job at hand, it will be churned into a useless clogging sludge. Thanks to the world's largest facilities for the testing and research of petroleum products, you can know in advance exactly how Stan-

# no testing here

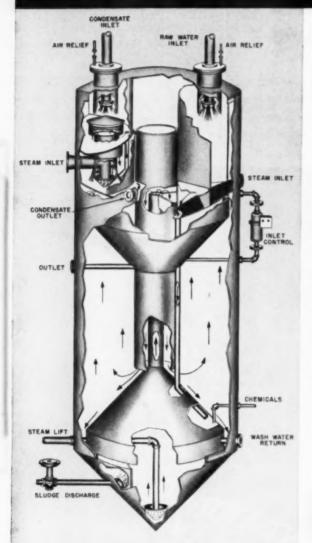
dard diesel oils will perform. Because they contain a special detergent and oxidation inhibitor, crank case and oil passages stay clean, carbon and gum formations are held to a minimum, rings

work freely and exhaust ports remain clear. Find out for yourself how Standard Oil Diesel Lubricants can lengthen the periods between overhauls and help you make substantial savings in maintenance and lubrication costs. Call in a Standard Oil representative today.



SOUTHERN POWER & INDUSTRY for OCTOBER, 1950

# The Hot Process ACCELATOR®



#### **MULTI-PASS TREATMENT FOR**

- Softening
- Silica Reduction
- Deaeration of Makeup and Condensate



## HERE'S THE ANSWER TO 3 OF THE POWER ENGINEER'S MOST COMMON PROBLEMS

SOFTENING: Positive internal slurry recirculation insures maximum softening, alkalinity reduction, and turbidity removal with a minimum of chemical expenditure. A steam lift effects the recirculation thereby eliminating mechanical pumping devices. A storage compartment within the tank holds sufficient treated water to handle momentary peak demands.

SILICA REDUCTION: Prolonged contact of the water undergoing treatment with the recirculating slurry as well as the redissolving of magnesium in the slurry, reduce silica to a new low.

**DEAERATION:** The steam lift effectively deaerates the makeup water undergoing treatment, thereby eliminating the need for separate deaerating mechanisms. The condensate enters a separate chamber in the upper portion of the tank and is recycled and scrubbed by its own steam lift system.

Check these advantages of the Descriting Hot Process Acceletor: 1. Self-contained descration for both makeup and condensels, 2. Controlled slurry recirculation, 3. Maximum silice reduction by the redissolving of magnesium. 4. Reprecipitation for chemical economy, and 3. An efficient low in tarbidity, altalnity, and hardness. Investigate the new Descrating Hot Process ACCELATOR. Write for complete information, new.



INFILCO INC.

GENERAL OFFICES: 325 WEST 25th PLACE - CHICAGO 16, ILLINOIS

WORLD'S LEADING MANUFACTURERS OF WATER CONDITIONING AND WASTE TREATING EQUIPMENT



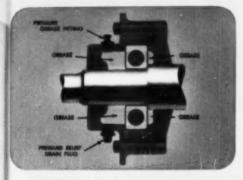
a TRI CLAD without halting production

GENERAL & ELECTRIC

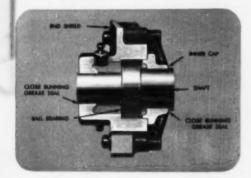




 EXTRA BEARING PROTECTION — Tri-Clad gives you extre bearing protection because heaviest standard-service bearings are carefully selected to withstand severe-loads for long periods.



EXTRA GREASE — Four times the ordinary amount of grease is packed into the large Yri-Clad grease reservoir. Since bearing life depends on grease, this means that Tri-Clad motors will run safety for years — for as long as any general-purpose motor you can buy.



SEALED-IN BEARINGS — Bearings and grease are completely sealed in a cast housing with long running seals for extra protection from dirt, dust, and lubricant leakage.

# TRI CLAD MOTORS will run safely without relubrication for as long as any general-purpose motor you can buy—

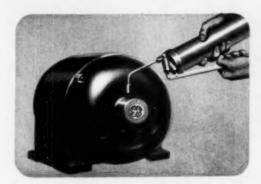
Tri-Clad extra lubrication "protection" can save you money because:

- Tri-Clad's oversize grease reservoir and the heaviest standard-service bearings mean you do not have to bother with greasing between motor check-ups.
- 2. When relubrication is needed on those tough applications, you can grease a Tri-Clad without interrupting production-line operations.

Tri-Clads are grease-gun easy to lubricate on the job. Moreover, a Tri-Clad motor will run safely where an ordinary motor would fail. Chances are you'll be spared the cost of a "special" motor.

YOU BE THE JUDGE! The best way to prove to yourself that Tri-Clad gives you the most for your motor dollar is to contact your local G-E office. Tri-Clad stocks are complete. Apparatus Dept., General Electric Company, Schenectady 5, N. Y.





PRESSURE-RELIEF GREASING — An efficient system of pressurerelief lubrication (with standard fittings) enables a Tri-Clad mater to be quickly and easily greased on the job when and if it's needed.

# You Save on 4 Counts with ENCO STREAMLINED BAFFLES

## Better heat transfer

Enco's improved baffle design insures a uniform, high velocity gas flow over every square foot of heating surface.

### 2 Low draft loss

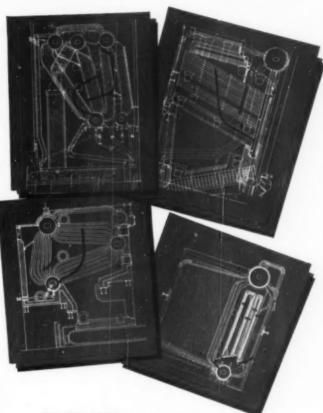
Smoothly curved baffles maintain a crossflow of gases across the tube banks. Dead gas areas, bottlenecks and eddy currents are eliminated.

# Less steam, less time for cleaning

Soot doesn't get a chance to accumulate in pockets. Soot blowers are used less often. Streamlined baffles lower maintenance costs.

## 4 Custom installation

Experienced Enco crews take charge of the installation, repairs and replacements of your individually designed streamlined baffles—do the job thoroughly and quickly with minimum downtime.

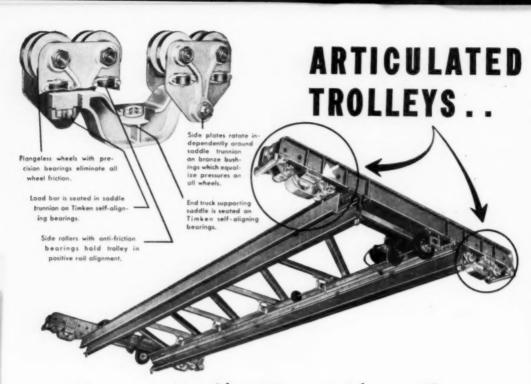


BULLETIN BW44 tells the full story, contains complete engineering data, explains how Enco Baffles provide maximum steam output with minimum fuel consumption. WRITE FOR YOUR FREE COPY TODAY!

### THE ENGINEER COMPANY

75 WEST STREET, NEW YORK 6, NEW YORK

IN CANADA: F. J. RASKIN, LTD., 4220 IBERVILLE ST., MONTREAL 34 P.Q.



# makes possible High Speed, Heavy Service AMERICAN MONORAIL CRANES



When each trolley wheel carries its share of the load in perfect alignment with the craneway tracks and all possible friction is eliminated, the result is perfectly articulated trolley travel.

Applied to American MonoRail Cranes, these articulated trolleys permit operating speeds of 500 feet per minute... constant service... handling loads up to 10 tons. And with this is offered all the flexibility of MonoRail design for interlocking carrier service between and beyond the craneways.

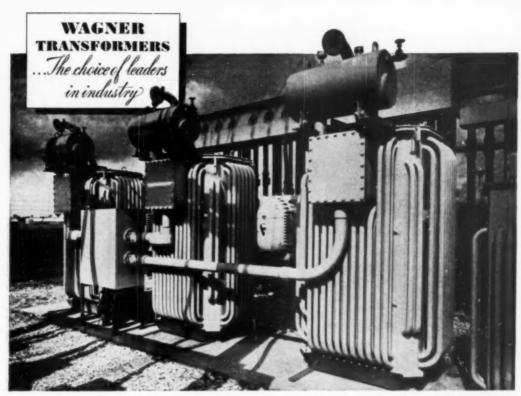
Let an American MonoRail Engineer explain all the advantages of these new cranes. Write for Bulletin MF-1 showing the development of American MonoRail Cranes for over-all plant service at low initial and operating costs.

THE AMERICAN

13105 ATHENS AVENUE

The same street and the sa

CLEVELAND 7, OHIO



Bank of 667 kva, 1 phase, 60 cycle, 2400 to 480 volt Transformers

## Wagner Transformers power the production of Rohm & Haas "Chemicals for Industry"

Production of "Chemicals for Industry" by the Rohm and Haas Company, makers of famed Plexiglas, is not a simple one-plant operation. The products of one of their plants may have no resemblance to the commercial products into which they are integrated at another plant. The natural raw material found in Texas, for instance—the processed chemicals manufactured there—and Plexiglas, an end product manufactured in another plant—are all part of a great modern production chain.

Power for production—with Rohm and Haas as with any modern industry—is provided by electricity. The manufacture of chemicals in the Rohm and Haas plant in Deer Park, Texas, is powered by Wagner Transformers and Wagner Motors. Wagner transformers in the main substation take energy at 69,000 volts and feed it to the low voltage substation at 2400 volts. The low voltage substation of Wagner transformers (illustrated above) in turn furnishes 480 volts to motors and to small air-cooled Wagner transformers which furnish 120 volts for lights and other single phase loads.

Thirty-one branch offices, located in principal cities, are ready to help you whenever you have a transformer problem. Users of Wagner Transformers also benefit by nationwide service facilities. Write for Bulletin TU-180 and TU-181 for full information on Wagner Power and Distribution Transformers.

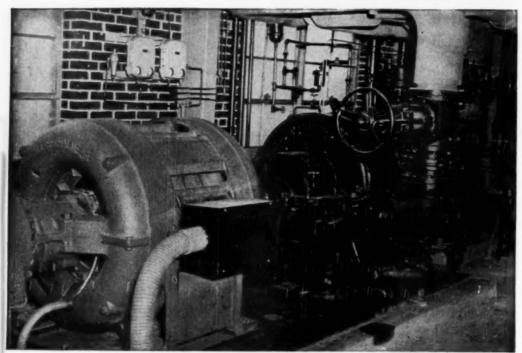


WAGNER ELECTRIC CORPORATION 6383 Plymouth Ave., St. Louis 14, Mo., U.S.A.

ELECTRIC MOTORS - TRANSFORMERS - INDUSTRIAL BRAKES AUTOMOTIVE BRAKE STETEMS - AIF AND REDRAUGIC

BRANCHES IN 31 PRINCIPAL CITIES

# The TERRY TURBINE



### For By-Product Power and Steam Balance

This 200 kw Terry Turbine driven generating unit operates in parallel with other generating equipment, the load on the unit being adjusted in accordance with the demands for exhaust steam. It is a single stage axial-flow, type, 4500/1200 rpm, 160 psi, 0 superheat, 5 psi back pressure, equipped with Terry reduction gears, oil-relay governor, motor synchronizer and back-pressure regulator.

The installation pictured above is typical of many special applications of Terry Steam jurbines, each designed for specific requirements.

Any of our district representatives will gladly give you full information on a turbine to meet your requirements, no matter how special they may be.

No obligation, of course.

T-1176



THE TERRY STEAM
TURBINE COMPANY
TERRY SOLIABE HARTEOPRICAN





Here is true simplicity...sturdy, practical, efficient. A minimum of parts in this Honeywell Transfer Valve makes it easy to maintain, easy to clean. (Complete disassembly requires only the removal of four nuts.)

If the fluid to be diverted is thick, or if it carries suspended solids... investigate this Honeywell Transfer Valve. It saves money, too... often replacing two gate valves and associated fittings. Available in Cast Iron, Bronze, and Galvanized Cast Iron, with Bronze, Iron, or Monel trim. Sizes 2" and up—two way or straight through—screwed or flanged.

Call in your local Honeywell engineer for detailed information about this valve or such other Honeywell Control Specialties as Hi-Lift Hand Control Valves, Liquid Level Devices, Steam-Jacketed Rotary Cocks, and the Honeywell Space-Saving Bypass.

MINNEAPOLIS-HONEYWELL REGULATOR Co., Industrial Division, 1992 Windrim Avenue, Philadelphia 44, Pa. Offices in more than 80 principal cities of the United States, Canada and throughout the world.



## "We Stopped Blows due to excessive Heating in a 600 Ampere Switch...

..BY CHANGING TO FUSETRON DUAL-ELEMENT FUSES"

... says W. R. Bishop Eureka, California



"A 600 Ampere 220 volt switch in one of our local schools was causing us a lot of worry. The fuses were running so hot that they were blowing on an average of every 3 or 4 days.

"A salesman told us about the lower resistance of Fusetron dual-element fuses, so we thought we would try them.

"That was more than six weeks ago and not one of the 600 ampere Fusetron fuses has blown. We have checked the switch and find that it is operating at a normal temperature."

W. R. Bishop, Owner

Eureka Wiring Service Eureka, California



# You get 10 Point Protection by changing to Fusetron Fuses

- 1 \* Protect against short-circuits.
- Protect against needless blows caused by harmless overloads.
- Protect against needless blows caused by excessive heating lesser resistance results in much cooler operation.
- Provide thermal protection for panels and switches against damage from heating due to poor contact.
- 5 Protect motors against burnout from overloading.

- 6 Protect motors against burnout due to single phasing.
- 7 Give DOUBLE burnout protection to large motors—without extra cost.
- 8 Make protection of small motors simple and inexpensive.
- 9 Protect against waste of space and money permit use of proper size switches and panels.
- 10 Protect coils, transformers and solenoids against burnout.

### Here's Why You Get This All-Purpose Protection

The fuse link element opens on short-circuit — the thermal cutout element protects on overloads — the result, a fuse with tremendous time-lag and much less electrical resistance.

They have the same degree of Underwriters' Laboratories approval for both motor-running and circuit protection as the most expensive devices made.

Made to the same dimensions as ordinary fuses — fit all standard fuse holders.

Obtainable in all sizes from 1/10 to 600 ampere, both 250 and 600 volt types. Also in plug types for 125 volt circuits.

There cost is surprisingly low.

(FUSETRON is a trade mark of the Bussmann Mfg. Co., Division of McGraw Electric Co.)



May cost you far more than replacing every ordinary fuse with a Fusetron dual-element Fuse.

#### MAIL THE COUPON NOW

Bussmann Mfg. Co., University at Jefferson St. Louis 7, Mo. (Division McGraw Electric C Please send me complete facts about FUSETE dual-element Fuses.			
Name			
Title			
Company		_	
Address		_	
City & Zone	State	90	



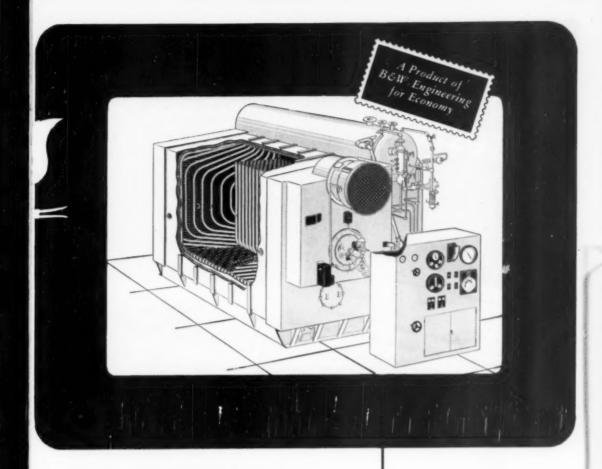
B&W Integral-Furnace Boiler, TYPE FM Shop Assembled...Ready to Use

Latest addition to a distinguished family is the new B&W Integral-Furnace Boiler, Type FM . . . developed from B&W's seventeen years' pioneering experience combining boiler and water-cooled furnace in a single, integrated unit.

Formerly available only in large industrial and central-station designs, Integral-Furnace Boilers have already accounted for over 100 million pounds per hour of new steam-generating capacity since their introduction in 1933. And now their proved advantages are incorporated in a completely shop-assembled, self-contained unit.

Small and medium size plants, institutional and commercial establishments will find in this unit all the answers to low-cost heating and process steam-generating requirements from 3,000 to 35,000 lb. per hr. at pressures to 250 psi. Large plants, too—where space and load characteristics warrant—may profitably consider several packaged boilers as against a "tailor-made" installation.

A creative engineering approach to boiler design, as so strikingly exemplified by this new arrival in steam-generating economies, has identified B&W with steam-power progress for more than 80 years. It may be just what is needed to insure big economies in the solution of your present problems or future plans.



### COST SAVING FEATURES OF THE NEW B&W INTEGRAL-FURNACE BOILER, TYPE FM

- Saves Erection Time and Cost
- Meets Wide Range of Services
- Handles Quick Load Changes
- Fast Steaming
- Low Maintenance
- Easy Accessibility
- Suitable for Outdoor Service
- Burns Oil and/or Gas
- Saves Fuel
- Saves Space
- Safe, Automatic Operation



Send for Bulletin G-72, detailing the many advantages of this new B&W creation in low-cost steam generation.

The Babcock & Wilcox Company, 85 Liberty Street, New York 6, N. Y.



Helping Industry Cut Steam Costs Since 1867

G-505

# DETROIT ROTOSTOKER

Modern Boller Unit Serves Hanes Dye and Finishing Company Winston-Salem, N. C.

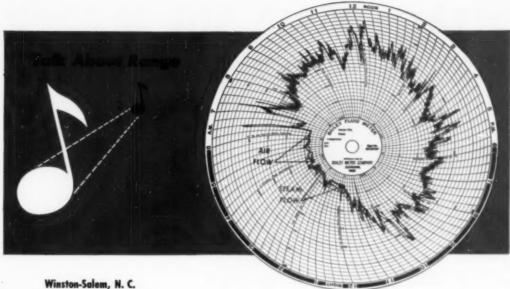
migh efficiency Stagle Unit B tend surings, provides incr sures 20% to fact to a 4



Detroit RotoStoker Power **Dumping Type in the Hanes** Dye and Finishing Company Boiler Plant.

Send for This Article





gets results with

### DETROIT ROTOSTOKER

With a modern boiler Detroit RotoStoker accomplishes a three-fold saving: Fuel saving was 20%; steaming capacity was increased 20% to a 60,000 lb. per hour maximum; the new generating unit occupies 37% less space than four old boilers it replaced.

Detroit RotoStoker follows load fluctuations of 12 to 1, in a 24 hour period, interspersed with sudden swings over a wide range, with close automatic control of pressure as a routine operation.

The Detroit RotoStoker is a money saver. Write for copy of the Hanes Story.



# IT WALKS and IT TALKS

THIS big dragline, powered by a single Cooper-Bessemer Diesel engine, strides across the land on pontoon feet . . . and chews into the earth in monstrous 10-ton bites.

Since the engine's speed is governorregulated, nearly constant, and since
maximum loads are encountered repeatedly, the bark of the engine's exhaust
tells the operator when to ease up, when
to "pile on the heat." So the Diesel in
this big dragline, as in most others,
talks in a language readily understood
by the experienced operator.

Here, in one of the toughest of all services, where engine load jumps from one extreme to the other a thousand times a day, you can learn a lot about engine quality and downright stamina. And because Cooper-Bessemer Diesels are more than a match for this brutal work, you'll meet them time and again in big, hardworking draglines.

Perhaps you have need for an efficient Diesel with exceptional, cost-reducing stamina? There are Cooper-Bessemers for every heavy duty service, stationary, marine and mobile, from 100 to 1600 bhp. Get in touch with the nearest Cooper-Bessemer office for specific information. Used for strip mining in Iowa, this big
Bucyrus Erie, walking dragline, with its
140 ft boom and 7 cu, vd. bucket, is
completely powered by a single
Cooper-Bessemer Diesal.

New York City Washington, D. C. Parkersburg, W. Va. San Francisco, Ca

Seattle, Wash. Tulsa, Okla. Caracas, Venezuela Glou Bradford, Pa.

n Francisco, Calif. Houston; Dalle Okla. Shreveport, La. Gloucester, Mass. Calmes

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

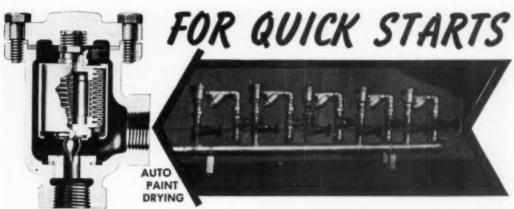
Pa.

Houston: Dallas, Greggton, Pampa and Odessa, Texas

Cooper-Bessemer

Corporation

St. Louis, Mo. Los Angeles, Calif. Calmes Engineering Company, New Orleans, La



### SARCO No. 9 THERMOSTATIC STEAM TRAP



END GLUING



**BOTTLE WASHING** 

### ... AND STEAM ECONOMY

The hours of waiting in the morning for steam equipment to warm up can be reduced to minutes with the Sarco No. 9 thermostatic steam trap. It is wide open when cold. All air and condensate pass quickly. Then, during normal operation, condensate is discharged at a temperature within 10°F of that of the steam. This has given the trap double its former capacity. No seat changes are required for varying pressures within the range of each type from 0 to 300 p.s.i.

### F F PUT ONE ON EACH COIL

This trap is so inexpensive that one can be placed on each coil or jacket and thus save enough in fuel and increased production to pay for the hook-up in a short time. The Sarco No. 9 is used extensively for process tanks, steam lines, radiators and wall coils, tracer lines and outdoor applications of all kinds. Ask for Catalog No. 250-A.

314

SARCO SAVES STEAM SARCO COMPANY, INC.

Represented in Principal Cities
Empire State Building, New York 1, N. Y.
SARCO CANABA, LTD., TORONTO B, ONTARIO

IMPROVES PRODUCT QUALITY AND OUTPUT



# Built to Cut Maintenance

E ASIER MAINTENANCE PROCEDURES and lower maintenance costs are important features of this brand new line of large motors. One man can perform all routine maintenance procedures, including opening up the motor for cleaning. Bearing surfaces are not exposed to abrasive grit and dirt during cleaning operations.

The appearance of this new line of large motors reflects the advanced design and fine workmanship that goes into their manufacture.

A well-braced, sturdy fabricated steel frame with cast-iron end brackets rigidly support and protect working parts. Ventilating openings are large to provide adequate cooling air at low velocities with resultant low sound level.

### Wide Range of Sizes

These new design Allis-Chalmers drip-proof and splash-proof squirrel-cage induction motors are built in sizes from 60 hp at 300 rpm to 1500 hp at 1800 rpm. Ask your Allis-Chalmers representative to show you the details of this exceptional new motor or write for Bulletin 05B6112.



### How's This for Accessibility

One man can remove the end brackets and air baffles and reach right inside motor with his vacuum cleaner or air hose. Bearing remains sealed against abrasive dirt throughout the cleaning operation.

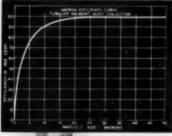
Large air discharge openings with removable louvers allow plenty of room to get in with an electric drill for doweling and bolting the motor to the base. Plenty of room to reach up back of the stator core for cleaning.

ALLIS-CHALMERS, 954A SO. 70 ST.

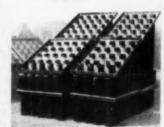
### **ALLIS-CHALMERS**

### THE VALMONT TYPE S COLLECTOR

CATALOG DIGEST











The following information is taken from the New Bulletin on P-D Valmont Type S Collector, For Complete Bulletin containing dimension tables, sizes, nomographs and suggested installation plans, write our Project and Sales Engineers.



HIGH EFFICIENCY-The outstanding contribution to higher efficiency in the P-D Valmont Type S is the inlet slot design. A patented development of Prat-Daniel, this inlet is high and narrow, reducing the radial distance of dust-travel. To explain its effect on dust collection, we quote from Cyclone Dust Collector Design, by Melvin W. First, Paper No. 49-A-127, presented at the Annual Meeting of the American Society of Mechanical Engineers, Nov. 27-Dec. 2, 1949, page 14.

"Entry width is an important variable in cyclone efficiency, as it controls the stream width. This, in turn, directly controls the radial distance particles must traverse to reach the cyclone wall and be separated by centrifugal force. The smaller the radial distance to be traversed, the lower the tangential velocity needed (less energy loss) and the smaller the particle that can be successfully separated for a given flow rate.

LONG LIFE-Extensive tests were made to determine the wear factor. All types of abrasive dusts were run at accelerated speeds, against various metals simultaneously and steel proved to be the most resistant to erosion.

Another long life factor is the lower velocity required due to the small tube diameter. It is a well-known fact that reduction of tube diameter produces higher centrifugal force. Thus, efficiencies are maintained at the lower load ranges.

MASS PRODUCTION METHODS-The P-D method of 'uni-bloc' construction permits manufacture and assembly of sub-sections at the factory. These are shipped to the field and easily erected, either vertically or horizontally, to fit the layout. Savings in cost of erection are thus realized yet the collector is "tailor assembled" to fit the installation requirements.

SMALL SPACE FACTOR-Because of close nesting of tubes possible in P-D Valmont Type S Collectors, the space required for this apparatus is much less than conventional collectors. In many cases, P-D units have been fitted into spaces that could accommodate no other type.

The Thermix Corporation, our Sales and Project Engineers are specialists in the art of dust collection. Consult them about your dust problems.

Project and Sales Engineers

### THE THERMIX CORPORATION

Greenwich, Conn.

(Offices in 28 Print Canadian Affiliates T. C. CHOWN, Ltd.

1440 St. Catherine St. W., Montreal 25, Quebec; 50 Abell St., Toronto 3, Ontario

### PRAT-DA

Designers and Manufacturers of Power Plant Equipment for Over 25 Years

82-10 WATER STREET . EAST PORT CHESTER, CONN.

piping maintenance

costs more

now!

You do less of it

by using Dependable Quality

CRANE VALVES

more Crane Valves
are used
than any other make

... no bonnet trouble with this valve

A typical example of low-maintenance Crane Quality—No. 465½ 125-Pound Iron Body Gates. Rarely does the bonstruction includes reinforcement to prevent distortion and utilizes more bolts, more closely spaced than is usual in valves of this class. Crane precision-guided seating reduces seat and disc wear. Packing has long life because these valves have a deep stuffing box filled with high grade asbestos ring packing. A ball-type gland equalizes the packing load.

Better performance features like these make Crane the better buy in valves of every type. Ask your Crane Representative for a demonstration.

CRANE

CRANE CO., General Offices:

836 S. Michigan Ave., Chicago 5, Ill.

Branches and Wholesalers Serving All Industrial Areas

VALVES . FITTINGS . PIPE . PLUMBING . HEATING



THE FLEXIBILITY OF THE COCHRANE ZEOLITE SOFTENER PLUS THE SIMPLICITY OF THE HYDROMATIC VALVE MAKE THIS THE IDEAL SOFTENER FOR YOUR NEEDS

A wide range of zeolite materials is available with Cochrane equipment and Cochrane will recommend the type best suited for your particular problem. Siliceous and Non-Siliceous zeolites are available. The siliceous include low and high capacity greensands and the synthetic gels. Non-siliceous include the coalbase type and phenolic and styrene resins.

# COCHRANE

HYDROMATIC

The Cochrane Hydromatic Single Control Valve combines, in a single pilot-actuated valve, the functions of six individual gate valves common to the customary "valve nest". May be arranged for manual or automatic operation.

COCHRANE CORPORATION 3110 N. 17th St., Philadelphia 32

> In Canada: Canadian General Electric Co. Ltd., Toronto

In Mexico: Babcock & Wilcox de Mexico S. A., Mexico City

In Europe: Recuperation Thermique & Epuration, Paris

Write for a copy of this new booklet on the Cochrane Zeolite Saftener, with the Hydromatic Valve.







Cochrane Corporation	
3110 N. 17th St., Philadelphia	32, Pa.
Please send me a copy of Publicatio on the Cochrane Zeolite Softener.	n 4520,

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	State

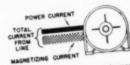
Jim —
These Sprague on the spot
Power factor Capacitors look
like the perfect answer to
our power problem. Check it!
B.J.G.

# SPRAGUE CAPACITORS Save You Money!

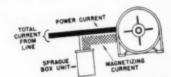
Whether you buy your power from a public utility company or produce it yourself, *low* power factor represents needless, moneywasting inefficiency.

Install Sprague Power Factor Capacitors right at the source of waste, and you'll be providing in effect a local generator which supplies—at low cost—the non-productive magnetizing current required by the load. Savings are often extensive enough to repay the cost of the installation in a year's time.

For an estimate on how much you can save by correcting power factor the efficient way, call in a Sprague representative. You'll be under no obligation. Or, write for our free booklet of cost-saving suggestions, Catalog 50B, today.



This induction mater is operating under partially loaded conditions without Power Factor Correction. The feeder line must supply 807H magnetizing (reactive) and power circuits.



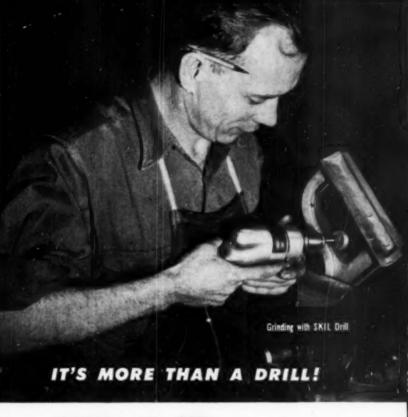
Here's the result of installing a Sprague Capacliar to supply the magnetizing current required. Total requirement is reduced to power current only, thus either reducing power cost or permitting the use of more electrical equipment on the same circuit.

SPRAGUE

SPRAGUE ELECTRIC COMPANY

North Adams Massachus

ELECTRIC AND ELECTRONIC DEVELOPMENT



### SKIL Drill speeds dozens of jobs . . . saves minutes and money on every one!

Look at the big variety of jobs these SKIL Drills are built to do. Their extra power speeds all ordinary drilling, makes easy work of heavy boring, reaming and hole sawing and equips them to take on special applications like powering hoists and pipe threaders.

SKIL Drills provide this extra power without extra weight. Die-cast housings (pioneered by SKILSAW) save important ounces in every model. Ask your own maintenance men about SKIL

> Drills. Take their word for it, and you'll standardize on SKIL Drills from now on. Call your SKIL Tools Distributor today!

SKIL

SKIL Products are made only by SKILSAW, INC. 5033 Elston Ave., Chicago 30, III. 29 North Ave.,, N.W., Atlanta 3, Ga. 918 Union St., New Orleans 13, Lo. 2124 Main St., Dallas I, Tex. Catherine and Forsythe Sts., Jacksonville I, Fla.





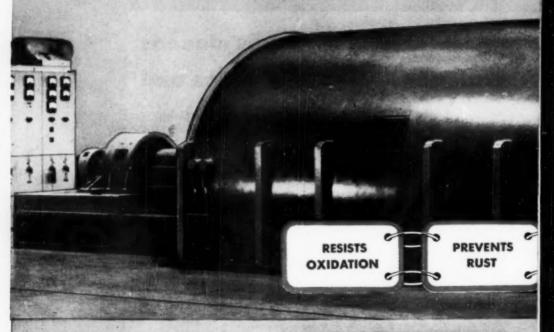


Hack sawing with SKIL Drill

# A turbine oil SINGLAIR

Cats seem to live a charmed life. And in many ways so do Sinclair SINTURLITE Oils! You'd expect the grueling conditions of turbine service to cut short the life of any oil. But SINTURLITE is different!

Not just for months—but for years—SINTURLITE keeps right on lubricating efficiently . . . resisting oxidation, retarding sludge formation, preventing rust, separating readily from water. Long serv-



For lubrication counsel, see your nearest Supplier of Sinclair Products or write to Sinclair Refining Company, 630 Fifth Avenue, New York 20, N. Y.

SINCLAIR

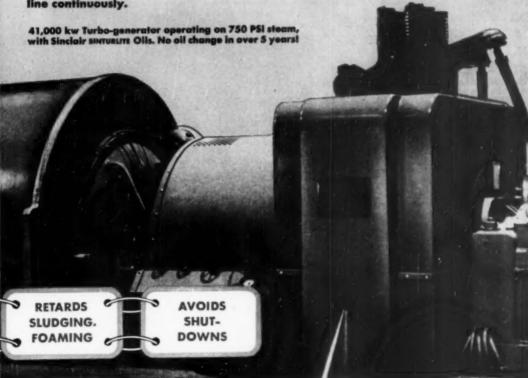
with nine lives...

# NEURLIE

ice life is assured by the superbly refined petroleum base and proven additives that are combined in SINTURLITE.

Avoid shutdowns—let SINTURLITE Oils keep your turbines on the

line continuously.



## How the Ljungstrom Air Preheater

can modernize "middle age" boilers

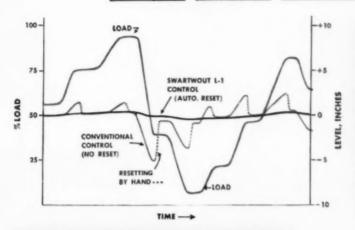
The lightness and compactness of the Ljungstrom Air Preheater makes installation possible on "middle age" boilers with minimum change in the existing structure. This addition of the Ljungstrom Air Preheater, with its continuous regenerative counterflow principle permits operation at lower exit gas temperatures ... assuring increased heat recovery and reducing the amount of fuel required.

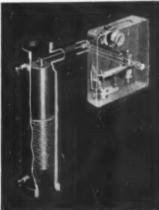
In a matter of a few years the Ljungstrom Air Preheater will effect savings that will more than offset the initial installation cost. If you are interested in approaching modern performance standards with your "middle age" boilers, our engineers will welcome the opportunity to show you how the Ljungstrom can raise the overall efficiency of your plant.

The Ljungstrom operates on the continuous regenerative counterflow principle. The heat transfer surfaces in the rotor act as heat accumulators. As the rotor revolves the heat is transferred from the waste gases to the incoming cold air.

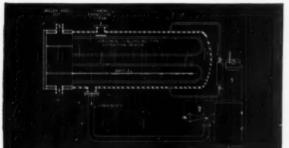
### CORPORATION

# Swartwout L-1 Control maintains condensate level within ±½ inch in horizontal subcooled heaters without manual readjustment!



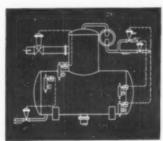


Operating on balance of forces principle, Swartwout L-1 Liquid Level Control has little actual movement of parts. Changes in liquid level vary effective weight of buoyant float . . . permit complete control or throttling over full float length of from 15 to 120 inches. Reset and setback features automatically compensate for any load condition.

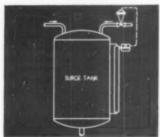


Horizontal subcooled heat exchanger (above) reduces degradation of heat in extraction steam by cooling condensate below saturation temperature. L-1 Control (1) holds level to ±½ inch for maximum heat extraction at any load. Swartwout V-10 regulating valve (2), with exclusive scroll inlet, withstands punishment of high-velocity flashing condensate.

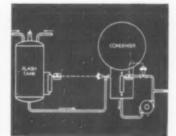
# Swartwout



Deaerating Heaters. – Swartwout L-1 Controls are used for normal (A), emergency (B & D), and overflow (C) control. Also used in stage heaters for normal, emergency and by-pass control.

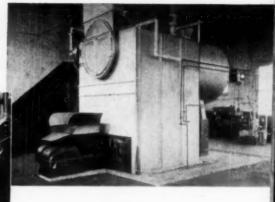


Surge Tanks.—Swartwout L-1 Control fgives extended range over virtually entire height of tank for maximum "flywheel effect." L-1 Controls are also ideal for storage tanks.



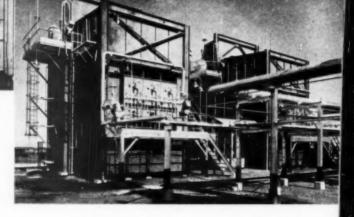
5 Flash Tanks and Condenser Hot Wells.
5 Flash tank drains to hot well where Swartwout L-1 Control precisely maintains required level by controlling condensate recirculating pump discharge.

SEND FOR BULLETINS S-15-A, S-208A . THE SWARTWOUT COMPANY, 18511 EUCLID AVENUE, CLEVELAND 12, OHIO



# Planning

Installation for medium and smaller plants . . . pressure to 475 psi . . . capacity to 60,000 lbs. of steam per hr . . . suitable for any type of fuel.



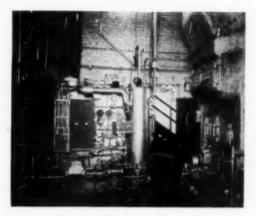
Installation for larger plants . . . pressure to 1000 psi . . . temperature to 900 F . . . capacity to 350,000 lbs. per hr . . . any fuel or type of firing . . . indoor or outdoor type construction.

### COMBUSTION ENGINEERING

MERGER OF COMBUSTION ENGINEERING COMPANY, INC. AND THE SUPERHEATER COMPANY

Installation for small plants . . . pressure up to 150 psi . . . capacity to 12,000 lbs. of steam per hr . . . adaptable to any fuel.

to buy BoilERS
...this year
...mext year



Installation for special conditions including very limited space... quick steaming (full capacity in 3 min.)... fully automatic operation... capacity to 6000 lbs. of steam per hr... pressure to 300 psi. Ideal for intermittent load.

Sometime this year, or perhaps next, your company may decide to buy new boilers... to replace obsolete units... to meet increasing steam demands... or for a new plant. Whatever the time or circumstances, here's something it will pay you to remember. With fuel and operating costs firmly established at new high levels, today more than ever before, the first cost of a new boiler is decidedly secondary to the annual operating cost. In fact, the annual cost of fuel alone for the average boiler installation nowadays usually equals or exceeds the purchase price. And the normal life of a boiler should be 20 to 30 years, or longer.

Obviously, then, the operating economies accruing from better design, construction or application, will quickly offset the difference between the cheapest boiler you can buy and the best the market affords. Here is one case where the old adage "the best is the cheapest" really applies.

In addition to having installed thousands of industrial boilers . . . in every size category from less than 100 horsepower up . . . Combustion has designed and built many of the country's largest utility power station boilers. And it is in this field — the manufacturing of power on a large scale — that boiler design and construction are evaluated most critically and exhaustively.

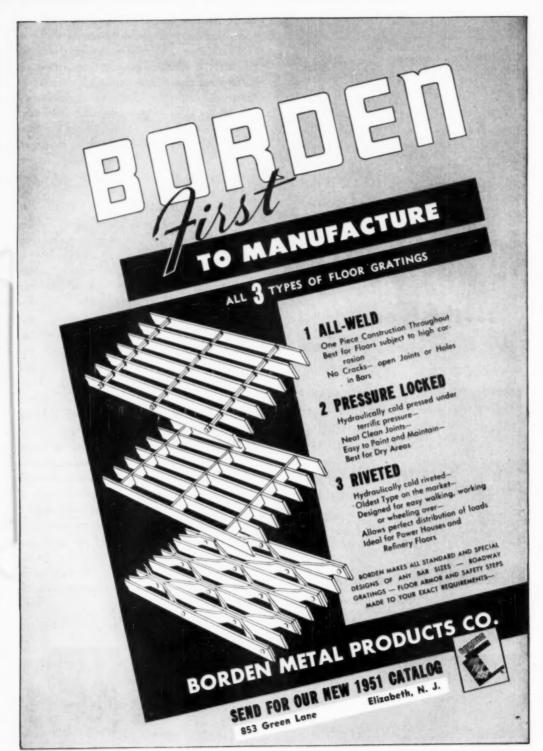
The fact that C-E Boilers have been selected to meet the exacting performance standards of so many of the nation's largest utility power stations is evidence of the quality of design and construction you can expect to find in any boiler, large or small, that bears the Combustion nameplate.

Our recommendations as to the most suitable type of boiler and firing equipment for the specific requirements of your next installation are available to you and your consultants without obligation.

B-383A

- SUPERHEATER, INC.





### Industry Speaks

### Industry Geared for Defense

American manufacturing plants, because of their vast wartime and postwar expansion, are geared to meet not only the requirements of the military but the needs of the civilian population as well. The following are brief comments from industrial executives made on the NATIONAL ASSOCIATION OF MANUFACTURERS' August 14th coast to coast breadcast.

### On Machine Tools

Charles J. Stilwell, President The Warner and Swasey Co., Cleveland

"Our plants have far larger capacity for building machine tools than was the case at the start of the second World War. In fact, machine tool capacity is far greater than has been called for since the close of the war. At present, the industry is producing about 30 per cent more than it did last year, and operations could be expanded to meet twice the present demand. It takes time to produce machine tools, and it requires skilled workers who may have to be trained. We have plenty of material on hand. Upon mobilization of the country's tool plants the only bottleneck to develop will be one of time—but not for potential capacity."

### On Electric Utilities

Louis V. Sutton, President Carolina Power and Light Co., Raleigh

"The electric utility industry will have plenty of power to meet the needs of our country during the emergency, provided no limitations are imposed which would prevent carrying out the great construction program now under way. We are in better shape to meet the power requirements of war than we were when the nation entered World War II, during which conflict electric power was never too little or too late. Right now the industry has one-third more generating capacity, and by the end of 1953 will have three-quarters more than it had on V-J Day."

### On Rubber

H. E. Humphreys, Jr., President United States Rubber Co., New York

"The rubber industry's job is to produce what our country needs for defense as well as for civilian purposes. Today we are in much better shape to do this job than ever before. Our raw materials situation is better. Today, we have not one but two raw materials—natural rubber and synthetic rubber. We have them both in reasonable

amounts. Before World War II our industry could turn 85,000 tons of rubber into finished products each month. Now, we can process 110,000 tons a month."

### On Oil

Robert E. Wilson, Board Chairman Standard Oil Co. (Indiana), Chicago

"Since the end of the last war, the petroleum industry has increased its capacity to produce, refine, and transport petroleum products by more than 25 per cent. It has spent over eight billion dollars on additional facilities. Much of that expenditure came from plowing back a large proportion of its postwar profits. For the immediate future, oil companies can supply all military requirements and meet all civilian needs on the usual scale. There is no need of rationing, even if military demand expands substantially from present levels. Of course, looking further ahead, nobody can predict with certainty the levels which military needs might attain or whether far higher levels could be met in full without some limitations on the quality or quantity of civilian supplies. Competition should continue so far as possible without governmental controls if the strength of our industry is to be fully utilized."

### On Steel

Clarence B. Randall, President Inland Steel Co., Chicago

"Today we have more capacity to make steel than all of the rest of the world put together. Since the last war started we have built as much new steel capacity as existed in all of Germany when that war began. This new capacity is in itself sufficient to meet the present war demand. We can do the war job and still give the civilian population as much steel as it had altogether in 1940."

### On Production

Clarence B. Randall, President Inland Steel Co., Chicago

"At no time in its history has the productive might of American industry been so well prepared for whatever job is ahead. Manufacturing capacity of this country is at least 50 per cent greater today than it was in 1940.

"American productive might can be best maintained as such by a minimum of economic controls and governmental interference. Industrial management has time after time demonstrated its understanding of national problems and its ability to out-perform the world. If the time should come when allocations and priorities are required in the public interest, then such controls can best be exercised by industry committees functioning under government approval and protection."



# STOP Destructive Pipe-Line Stresses

# with CHAPMAN TILTING-DISC CHECK VALVES

VALVE WITH CUSHIONED CLOSING!



Cross-section of the Chapman Tilting Disc Check Valve illustrating the way that the balanced disc is supported on the pivot, with arrows showing the travel of the disc. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats. When you reduce slamming you reduce the hazard of rupturing pipe lines, opening up joints . . . . a host of maintenance problems.

That is why we suggest you investigate Chapman Tilting-Disc Check Valves. The balanced disc in this unusual valve lifts away easily in opening . . . rides smoothly on the flow . . . closes quickly but quietly. There's no slamming . . . minimum wear on valve parts and minimum stresses on pipe lines.

Special designs with dashpots are also available for use under unusual operating conditions, where no self-acting Check Valves can function satisfactorily.

Made in both iron and steel . . . pressures up to 3000 pounds. You'll find it will pay you to write today for more information on this valve developed by Chapman. Request Bulletin #30.

The Chapman Valve Mfg. Co.

### **Timely Comments**

### **Better Production**

#### Important Reader Service

SOUTHERN POWER & INDUSTRY'S primary function is READER SERVICE to engineering personnel in Southern and Southwestern industrial and power plants. Each month the page 17 Reader Service Reply Card brings

to plant engineering personnel valuable bulletins, booklets, handbooks, and catalogs.

Through active field correspondence, SP&I also continues its services on both technical and business problems. Whether your problem relates to materials handling, power generation, or instrumentation, it receives careful and prompt attention.

#### Special BETTER PRODUCTION Service

The annual BETTER PRODUCTION issue contains a great many short articles showing what specific Southern and Southwestern plants are doing to increase output and improve performance. Many of these plant tested procedures and improvements can be copied and put to work toward increasing production in your own plant.

The many BETTER PRODUCTION case histories presented on the following pages are necessarily brief. Emphasis is concentrated on direct information—need and objectives, description of improvements, and results.

#### Free Information

Plant engineers will want additional information on many of these case histories—more detail regarding principal equipment that contributed to the improvement, additional applicational data, and more complete evaluation of results.

This information is available to readers of our BETTER PRODUCTION ISSUE without charge or obligation. If you desire additional data on any of the case histories, simply circle the number on the coupon below, and mail the coupon to us with your name, title, company and address plainly written. We will request the equipment manufacturers to send the desired information direct to you.

### BETTER PRODUCTION

Mr. Francis C. Smith, Editor SOUTHERN POWER & INDUSTRY 806 Peachtree St., N. E. Atlanta 5, Georgia

Service Coupon Dear Mr. Smith:

Street

Tear Out and Mail Now Please send me without obligation, additional information on the following case histories that were presented in the October BETTER PRODUCTION issue of SOUTHERN POWER & INDUSTRY.

12 13 16 19 20 11 31 32 33 34 35 36 39 40 29 30 51 52 53 56 59 60 50 68 73 76 82 83 84

Name Position

Company Name

City Zone State

Section I

### MATERIALS HANDLING

### Case Studies

Monorail installation . . elevator for loaded trucks . . guided pallets . . automatic packing systems . . woven wire conveyor belt . . hinged dock platform . . vacuum unloading . . fork trucks, attachments and palletization

Case I-North Carolina Textile Mill

### **Cotton Mill Lap Conveyor**

mill has solved the problem of lap handling by installing an efficient, modern lap conveyor.

The old method for transferring

LARGE North Carolina textile laps from pickers to cards was by placing them on trucks and trundling them through the mill from one department to the other. This arrangement was slow and cum-

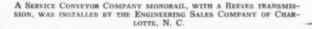
age space on the floor was required for 75 to 80 laps all the time, which floor space was badly needed for additional machinery,

bersome and the labor cost was all out of proportion to the job. Stor-

The mill was already working out a modernization program, so the solving of this problem fitted nicely into the general plans. A monorail conveyor built by Service Conveyor Company, of Detroit, with a Reeves transmission, was selected. The installation was made by Engineering Sales Company, of Charlotte, N. C. Only 2 hp is required to operate the 800 ft of track, upon which is being carried up to 85 laps, at a speed of 18 ft per minute.

**Operating Results** 

The results after two years of operation are very impressive. The traffic problem, which was a considerable nuisance before, has been solved, and time lost through delays in truck movement has been eliminated entirely. However, the outstanding saving is counted in dollars and cents. Three full-time employees were transferred to other duties, resulting in a net savings of approximately \$8,000 annually.





### **Elevator Handles Loaded Trucks**

TWICE each year important furniture shows are held in the Southern Furniture Exposition Building at High Point, North Carolina. Although four stories had

35,000 lb was installed by the Otis Elevator Company. Reputed to be one of the largest of its type, this elevator will accommodate the largest van operating on the highLoaded trucks now back onto the elevator from the street level and are lowered to the basement. There they are unloaded. In due course they are returned to the street by the same facility. There is no delay; no traffic interference.

Adequate bracing had to be provided to enable the car to withstand extraordinary weights and the terrific impact of trucks in motion, Normally, diagonal bracing is

#### Better Production

These case histories are necessarily brief with emphasis on direct information. For more detail regarding equipment or more complete evaluation of results, simply circle the specific case number on the page 65 service coupon

been added to the building in 1940, the need for additional facilities increased after the war.

Then, too, exhibiting manufacturers often had trouble getting their furniture and display equipment in and out of the building. Their huge vans had to back up to old-fashioned loading docks to discharge or take on their loads. Traffic in adjacent city streets was blocked and trucks were delayed.

In time for the July show this year, these unsatisfactory conditions were entirely eliminated. A new \$1,000,000, 10-story structure was added to the main building to provide extra space. A freight elevator, unique in size and capacity, and other vertical transportation equipment was installed to solve the materials handling and traffic problems.

To make way for the new addition, the loading docks in the rear of the main building were razed last October. Built of brick and reinforced concrete, the addition was rapidly erected by "pan-type" construction methods, one completed story at a time.

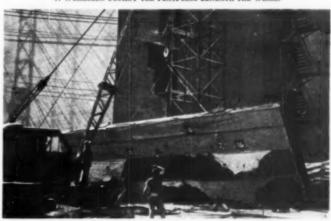
#### New Elevator

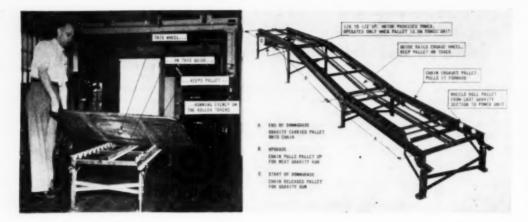
During construction, a hydraulic truck elevator having a capacity of ways today.

The elevator car platform alone weighs 16,600 lb and measures 12 ft by 40 ft. Equipped with push-button control and power operated doors, it will travel between two levels from the first floor to the basement of the addition which opens into the basement of the main building.

resorted to at the top of large capacity freight elevator cars which requires extra room in the overhead. In this case, however, Otis engineers found that overhead heights were limited. Therefore, a relatively deep pit was dug to permit diagonal bracing beneath the car to support the ends of the car platform.

This huge 12 x 40 ft, 16,600 lb elevator car platform was assembled at the Otis factory in Harrison, N. J., and shipped in one piece by freight car to High Point, N. C. There the problem of getting the platform into its own permanent shaft without knocking down the construction shaft was further complicated by nearby, low-hanging high tension power lines carrying 23,000 v. Workmen jockey the platform beneath the wires.





Case 3-Woodworking

### **Guided Pallet for Better Handling**

DURING the past year, a guided pallet installation cut direct labor cost 25 per cent in the finishing department of a large furniture company. A 50 per cent

reduction in processing time, plus increased production, has resulted since the 700 ft system was put in use.

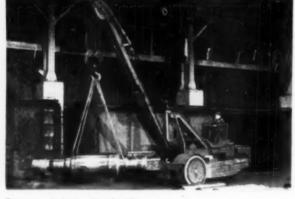
Off-the-floor handling has low-

ered plant clean-up costs and improved safety conditions. Handling damage to furniture has been entirely eliminated.

The Guided Pallet gravity sections, a product of The Rapids-Standard Company, Inc., of Grand Rapids, Michigan, are manufactured in three widths and in 5 and 10 ft lengths. A row of conveyor wheels bolted to the side frame project slightly above the side members, forming a rollway for the pallets. A steel channel in the center of the conveyor frame provides a guide-way for a small wheel bolted to the underside of each pallet, preventing shifting in transit.

Spur curves and right-angle take-off units permit palletized materials to flow from one line to another, or to be shunted to adjoining processing area. Work stations, fitted into gravity sections, are equipped with a capturing device that locks pallet guide-wheel, permitting materials to be raised or lowered by a foot-operated air hoist. When raised the pallets can be rotated to any desired position for working convenience.

Power units, equipped with 1/6 to ½ hp motors, operate only while pallets are on the units. A chain drive mechanism grips outer bottom edges of each pallet, indexing it forward while elevating materials for gravity run. A steel guide channel, as in gravity sections, engages pallet wheel and keeps it centered. Pallets may be constructed of plywood or other hard-surfaced material, in sizes to fit products handled on the line.



Case 4-W. Va. Steel Mill

### **Swing Boom Crane**

THIS Krane Kar Mobile Swing-Boom Crane, manufactured by Silent Hoist & Crane Co., is in service at Weirton Steel Co., Weirton, W. Va.

The Krane Kar changes roller and bumper plates on 54" roller tables. This job and many other miscellaneous lightweight lifting jobs were formerly handled by Overhead Cranes. These rollers only weigh a few thousand pounds, so Krane Kar is used to free the 50-ton overhead crane for more important duties, keeping things moving in these critical days.

### **Automatic Packing System**

THE Richardson Automatic Packing System has been finding increasing acceptance packing flour in flour mills. Once



AUTOMATIC FACKING SYSTEM OF RICHARDSON CONSISTS OF SCREW-TYPE FEEDER, AUTOMATIC SCALES, PACKER, AND CONVEYOR.

the capabilities of this system are realized it is believed that it will find extensive use in the chemical field for bagging finely ground materials having the characteristics of flour. The following speeds have been obtained on this packing system: (One man packing and sewing his own output) textile bags: 50 lb - 5 bags per min: 100 lb - 4 bags per min; paper bags: 3-4 bags per min; (one man packing and another man sewing) textile bags: 50 lb - 8 bags per min; 100 lb - 5-7 bags per min; 140 lb - 4 bags per min; paper bags: 100 lb - 6 bags per min. The above speeds have been obtained on flour as against speeds of 1.3 to 1.7 bags per minute before this machine was installed.

The packing system consists of 4 main units:

1. Screw-type Feeder - using

two full flow screws and one dribble screw delivers material from storage to the automatic scale (unit No. 2). The dribble screw insures a sufficient supply of material to provide a complete and accurate weighing should this bin run empty. The motor drive includes a magnetic disc break to prevent coasting.

2. Automatic Scale - weighs equal drafts of material discharging them into the packer hopper below. This scale is used in thousands of installations by itself either as a bagging scale or bulk weigher for a large diversity of material. This scale has a dust confining housing. All control levers are mounted outside the dustproof housing where materials will not clog them. The preset weight of material is discharged from the weigh hopper of the scale by a solenoid mechanism controlled by the packer below.

3. Packer—features an auger inside a tube. An air operated bagholder slides up and down this tube. The motor driven auger packs the material into the bag while the bag and bagholder slide down the auger tube. Special air cylinders adjust the packing pressure.

A bag support or platform follows the movement of the bag holder, lowering the filled bag on to the sewing conveyor (unit No. 4). The platform then retracts leaving the bag standing upright on the conveyor. Interlocks prevent out-of-sequence operations. A bag counter tallies the bags filled.

4. Conveyor — V-Belt Sewing Conveyor conveys filled bags through the sewing head. Any spilled material from defective bags falls through the space between the V-belts. In some installations suction is applied beneath the conveyor. A flat belt is optional.

Metal which contacts the material is stainless steel or other non-corrodible metal. Write in for bulletin No. 3449 for complete details.



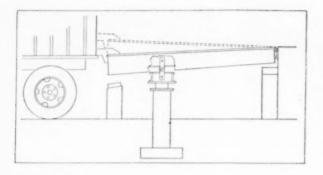
Case 6-Florida Food Industry

### **Woven Wire Conveyor Belts**

THE Juice Industries Division, Dunedin, Florida, is using a woven wire conveyor belt manufactured by The Cambridge Wire Cloth Company, Cambridge, Maryland, for quick freezing of its "Snow Crop" brand of frozen fruit juices.

The photograph shows the canned juice placed on the belt at the feed end of the freezing tunnel. This belt is 126' long and of a "Gratex" type construction. The canned juice rides through the freezing tunnel on this belt.

Advantages of the Cambridge "Gratex" belting in this application include a flat carrying surface for the cans, plus open mesh of any free circulation during the freezing operation.



Case 7-Missouri

### **Leva-Docks Save for Bottling Plant**

POUR troublesome factors are involved in loading and unloading at docks or loading platforms with power operated vehicles: (1) The variation of about 12" in loading level (distance from ground to floor level) of motor

transport equipment. (2) Spring compression or expansion when heavy loads are wheeled into or removed from the truck. (3) Maintaining a minimum inclined ramp that factory type trucks can climb. (4) Providing safe equipment

which can be positioned quickly and easily.

The Leva-Dock solves all four of these problems. The hinged Leva-Dock platform is raised by oil-hydraulic power, using a conveniently located control valve. Highway carrier is then backed into position. The Leva-Dock platform is lowered until the heavy supporting arms rest on truck bed floor. The gap between the Leva-Dock and truck is spanned by a hinged steel "throw-over" bridge. The hydraulic system is then released, allowing the Leva-Dock to move up or down with the truck bed as springs compress or expand in loading or unloading.

Leva-Docks, manufactured by Rotary Lift Co. of Memphis, are saving time and money for the Coca-Cola Bottling Co. of St. Louis, where cases of Coca-Cola are earried directly into highway carriers by fork lift trucks in a few seconds.

#### Case 8-Louisiana Rice Mill

### **Bulk Unloading Procedure Improved**

NLOADING rice from boxcars has been simplified and improved at United Rice Milling Products Company in New



Orleans, through use of vacuum equipment manufactured by Spencer Turbine Co., and supplied through Best Electric Company Inc., of New Orleans.

The principal equipment consists of a 75 hp vacuum producer

The principal equipment consists of a 75 hp vacuum producer which feeds directly into a 60" separator. The intake to the separator is fed from an 8" pipe line which extends the entire length of the freight car trackage within the plant. In this pipe line there are five equally spaced openings to which the portable "gulper" tool hose line is attached.

The operation of the system is quite simple. One control starts up the main 75 hp motor, and this starts the blower. Interlocked with this is a smaller 3 hp motor, and this starts up simultaneously with the main motor and commences the operation of a dumping device which is installed on the bottom of the separator. One car is unloaded at a time. The rice is pulled into the separator; then, by means of the dump unit which is attached to the bottom of the separator, it is thrown into an

elevator, and from this point it is carried to storage bins.

The guaranteed capacity of this unit is 20 to 22½ tons of rice unloading per hour. Actual tests have shown that this capacity has been reached and on certain types of rice has even been exceeded.

Only two men are required now to unload a car, whereas under previous operations, three to four men were required. It is felt that as they gain more experience with the system, this may be cut down to even one man.

The second and very important advantage is the fact that the new system eliminates entirely the dust nuisance. Under the old unloading method, the rice was dumped from the freight cars directly into an open conveyor system alongside the cars. This operation naturally caused considerable dust to be given off during the dumping period. With the suction system, no dust is encountered.

This is the second unit of its type in operation in the United States. The first unit has been installed in Houston, Texas.

#### **Automation in Food Warehouse**

OW-COST handling operations in a wholesale grocery warehouse include such factors as savings in time and labor, making efficient use of available space and storage areas; also accessibility of merchandise, flexibility, uniformity, visibility, orderliness and compactness.

These and other desirable features are achieved by the Weona Food Stores, Inc., Memphis, Tenn., where full advantage has been taken of their Elwell-Parker master-unit, palletized load principle, for utilizing space and saving time, labor and other costs.

#### Case History

Before the truck was installed 1650 cases of corn were unloaded from a box car and placed in stock, using four ordinary hand-operated wheel trucks. Two men had to load the truck, two others pulled the loaded truck to place, and four other men unloaded the truck and stacked the cases. Thus it took eight men 2½ hours to unload a box car, a total of 20 man-hours.

Using the power truck the same volume now is handled by two men—one of whom is the truck driver and the other a helper. This is a total of eight man-hours, as compared with 20.

The relatively small, center-control electric truck rated at 3000 pounds capacity frequently handles palletized loads weighing as much as 4000 pounds. Some staple products in cartons and boxes are received on pallets in the car, or in such shape that they can be picked up directly with the fork truck. Others must be placed on pallets preparatory to lifting and transporting; but once placed on pallets the loads remain intact on them up to the time they are to be delivered.

#### Case 10-Tennessee Foundry

#### **Truck Attachment for Pouring Molten Metal**

NE of the most complex, costly, and dangerous jobs in metalworking is the transfer of molten metals from melting furnaces to the molds. Because it must retain heat, transfer equipment must of necessity be large and heavy. And, for accurate pouring, transfer equipment must be easily and accurately controlled to assure a continuous stream of metal.

At a large Chattanooga, Tennes-

see, foundry, metal was formerly poured from the furnace to a transfer ladle and then poured again into hand pouring pots or crane carried pouring ladles. These latter had to be tilted by hand and since each ladle required the use of a crane or hoist operations were necessarily limited.

To solve the problem of increased production, engineers at the foundry worked with engineers at Yale & Towne Mfg. Co. and came up with an attachment for one of Yale's standard electric trucks that boosted production and removed several hazardous operations formerly required.

Besides increasing production, the fork truck controls pouring so closely that splashing hazards are now minimized. In addition, pouring is at a constant rate, and casting quality has been improved.

The molten metal is now poured from the transfer lable directly into a lable carried on a Yale truck. The truck moves to locations where hand pouring is required and fills hand fors, or delivers metal directly to the molds.



#### Wood Stain Problem Solved

K ING Lumber Industries, Inc., (offices in Baton Rouge, La., and mill in St. Francisville, La.) formerly stacked green lumber flat in its storage yard. This lumber was left to dry from 60 to 90 days and then taken either to the shipping dock or to the dry kilns for re-stickering. There was no allowance made for water run-off and. during periods of heavy rainfall. the lumber was exposed to considerable moisture. The result was excessive amounts of badly waterstained lumber, with resultant decrease in market prices.

The solution to this problem was an 8-ton Gerlinger lift truck, equipped with a Gerlinger-designed hydraulic side shift carriage and Slope Piler accessory. The Slope Piler is an attachment that enables the operator of a Gerlinger to quickly tilt the lift

truck's loading forks 5 degrees up or down from level position. It makes possible the stacking of loads on an angle for water run-off and is used in many areas where rainfall demands such angle stacking. It is also used to counterbalance poorly stacked loads for travel over rough ground.

The hydraulic side shift attachment is a special tool for materials handling under conditions where loading and unloading calls for special position of loads. It makes possible the stacking of loads flush with each other and flush with walls in warehouses, box cars, dry kilns, on trucks, or where it is necessary to prevent loads from shifting. The lift truck's carriage may be shifted 5 inches from center of truck to either side (10" overall) mechanically by the operator. This attachment enables



GERLINGER LIFT TRUCK ATTACH-MENTS IN USE AT KING LUMBER INDUSTRIES, ST. FRANCISVILLE, LA.

the owner to make fullest use of space where loads are being stacked

These two attachments have completely solved the water-stain problem of King Lumber Industries. Inc. Gerling lift trucks and straddle material carriers are manufactured by the Gerlinger Carrier Co., Dallas, Oregon.

#### Case 12-Southwestern Utility

#### Mobile Cranes and Lift Trucks Serve Utility Co.

utility is now doing twice the volume of parts and equipment handling in its central storage yard that the area was originally designed to take care of, thanks to its use of gasoline-powered mobile

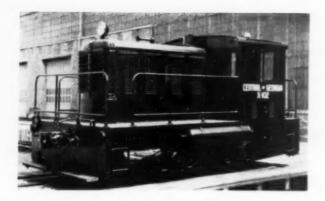
LARGE southwestern electric cranes and lift trucks. The company in its main and district storage yards is currently using forty 10,000 lb capacity Karry Kranes. fourteen lift trucks of 2,000 lb capacity, two lift trucks of 4,000 lb capacity, and one lift truck of 7,500

lb load limit, a total of 57 Hyster industrial truck units.

The central storage yard is six city blocks square and contains testing labs, covered warehouses, an open air storage area, rail spurs, pole yards, and maintenance facilities for motorized equipment. Previously all handling was done by railroad cranes, crawler type cranes and old style lift trucks. Handling in the district yards was primarily manual with jib booms to aid in truck loading and unloading.

Now the pneumatic-tired, gasoline-powered mobile cranes and fork lift trucks make possible faster and more efficient handling of miscellaneous electrical equipment and supplies. Included in the materials handled are telephone poles, packaged crossarms, transformers, steel braces and fittings, radiators, coils of wire, reels of cable, and other electrical parts.





Case 13-Georgia Wood Preserving

#### **Diesel Locomotive Makes Saving**

COUTHERN Wood Preserving tive which replaced a small steam

Company credits over \$600 per locomotive at its Macon, Georgia, month savings to a Diesel Locomo- operations about one year ago.

The new Whitcomb Locomotive Company, 35 ton, Diesel-electric locomotive which is a combination narrow-standard unit operates now on narrow gage track, but will be changed to standard when yard trackage is changed to standard gage. The locomotive handles all intraplant switching of railroad cars and the switching of timbers, ties, poles, etc., to various points in the plant after the material has been unloaded to treatment trams.

Weekly savings which can be readily tabulated include:

Fuel	\$66.87
Direct Labor	34.40
Repairs and Maintenance	43.40
	married at

There are other advantages such as faster movement of materials and improvements in other operations which cannot be readily eval-

\$144.67

Case 14-North Carolina Warehouse

#### Fork Trucks and Palletization Speed Handling

OW would you like to be responsible for handling 100,000 different stock items in a single building? That's the problem of C. O. Jenkins, general manager of the half-million square foot mail order installation of Sears, Roebuck and Co. in Greensboro, N. C.

Variety is not the entire problem, Jenkins points out. The nature of the operation is such that turnover cannot be predicted too closely, and the warehouse must be geared to extraordinary changes in volume. To handle about 15 carloads of merchandise a day. Sears uses 16 industrial trucks made by the Automatic Transportation Company.

Jenkins cites as a major accomplishment, the exceptional amount of available space actually used for storage. Out of 604,145 sq ft, 484,102 sq ft are devoted to the building's prime purpose. This is in excess of 80 per cent. Because of palletization, used wherever possible, narrow aisles-10 to 12 feet-and high stacking, almost all the air space under the 18 foot ceilings is used profitably.

About 60 per cent of incoming merchandise arrives by rail, and is unloaded at the 11,000 sq ft railroad dock by fork trucks. The rest, coming in by highway van, is unloaded at the six truck docks, which occupy nearly 13,000 sq ft. None arrives on pallets.

CRATED SINKS, STACKED WITHOUT PALLETS TO A HEIGHT OF 16 FEET ARE TIERED 12 HIGH. SEARS USES EVERY POSSIBLE CUBIC FOOT OF STORAGE AREA.

Merchandise, palletized inside cars, is removed by Transporters, Automatic's driver-led electric industrial trucks and placed on the dock. From that point a Skylift fork truck takes over, carrying the pallet load to the assigned area and stacking it. Tiering height varies from 12 to 16 feet according to the nature of the goods.

Sears uses four driver-ridden Automatic tractors and two operator-led Trans-tractors. The riding type units handle long trips from the dock to the front of the plant.



Section 2

# **INSTRUMENTS AND CONTROLS**

#### Case Studies

Waste neutralization by pH control..automatic control for continuous tunnel kilns..telemetering and remote pressure controls for utility..size cooking system

Case 15-Southeastern Fibre Plant

#### Wastes Neutralized by pH Control System

A LARGE synthetic fibre plant in the south Atlantic area was confronted with a major waste-treatment problem. Four different types of waste—sanitary sewage, sulfide, alkali and acid fluids—must be treated before discharge into a nearby river.

FLOW DIAGRAM OF WASTE TREATMENT PLANT FOR HANDLING FOUR DIFFERENT TYPES OF WASTE FROM A LARGE SYNTHETIC FIBRE PLANT. MICROMAX AUTOMATIC PH CONTROL IS APPLIED TO NEUTRALIZATION OF ACIDITY, BY ADDING REGULATED FLOW OF LIME SLURRY IN THE TREATMENT CHAMBER.

Through a unique setup, all four wastes are combined into one effluent and neutralized effectively.

Acid and alkaline wastes from two different parts of the manufacturing plant are fed into a common tank where they partially neutralize each other. The sulfide wastes are oxidized to sulfates and then fed into a retention basin with the filtered sanitary wastes, the effluent from this basin being then fed to mix with the other two wastes. The resulting mixture is on the acid side, and is neutralized

by feeding lime into the series of treatment chambers. Rate of flow of lime is automatically regulated by a Micromax pH Control system.

Control equipment consists of an L&N Glass Electrode Assembly, through which is pumped a continuous sample of the mixture in the reaction chamber. A Micromax pH Controller measures and records waste pH detected at the electrodes, and directs the lime flow by regulating an electric valve drive in the lime slurry line.

To neutralize their waste, the plant uses about 20 to 50 tons of lime daily. The L&N equipment maintains an optimum pH to a tolerance of ± 1 pH at the liming point. Complete neutralization of excess acidity is obtained with minimum lime consumption.

Case 16-Georgia Brick Plant

#### Instruments Help Make Brick

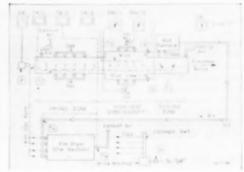
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WHEN down-draft batch type bee-hive kilns were employed at the Burns Brick Company, Macon, Georgia, five days were required to stack some 100,000 bricks from dryer cars. After kiln was sealed, a week was required to bring temperature up to 2000 F; another week for the cooling down period, and a third week for removal of the brick.

With the installation of continuous tunnel kilns and complete Brown automatic control, production was stepped up to some 50,000 bricks a day.

Since a temperature difference of 10 F in the firing zone can markedly change the color of brick, control of temperature is of critical importance to the brick manufacturer.





The centralized control panel at Burns Brick Company, Macon, Ga., shown at left, affords firgertip control of brick manufacturing processes. Schematic diagram shows instrumentation for one predbyer section and one kiln, Legend: TR-1 Drying and cooling zone temperature recorder; TR-2 Predryer inlet and outlet temperature recorder; TR-3 High-heat zone temperature recorder; TRC-1 and 2 Recording Temperature controller; SR—Brick machine production recorder; TR-Cap pusher pressure recorder; T, T., T.—Thermocouple; P.—Hudraulic car pusher; R.—Radiamatic radiation sensing element; G.—Tachometer generator which actuates SR.

#### Installation

Shown schematically are instruments which: (1) measure actual brick temperature in kiln; (2) automatically control temperature in high heat zone of kiln; and (3) continuously record a number of temperatures in the predryer, drying, high heat and cooling zones as well as temperatures of drying and exhaust air at several points. Additional instruments serve as operations recorders. Among these are: (1) tachometers on the brick machines calibrated to read directly in bricks per hour; and (2) pressure recorders on the hydraulic car pusher mechanisms which show the time each car enters the kiln and warn of any faulty opera-

tion of the mechanism or blocking of ears in the kiln.

A check on operating efficiency over a period of several years established the fact that the addition of automatic temperature control alone resulted in at least a 10 per cent increase in production as compared with the same processing methods on manual control.

#### Case 17-Tennessee Gas Distribution System

#### **Telemetering and Remote Pressure Controls**

#### By Hubert G. Howell

Chief Engineer-Gas Division City of Memphis, Tennessee

NCREASING gas demand in the city of Memphis made it necessary to establish a Dispatching Department to completely supervise the entire gas distribution system. As this department was organized, the absolute need for a better coordinated pressure control system became apparent.

Telemetering and remote control facilities were particularly applicable because the Electrical Department already had a large amount of private telephone cable in service, which could help toward economically adapting the telemetering and control system to the Dispatching Department's needs.

At the present time the system has approximately 469 pair-miles A FEATURE ARTICLE ON THIS TELEMETERING AND REMOTE PRESSURE CONTROL INSTALLATION WILL APPEAR IN THE NOVEMBER ISSUE OF S.P.I., AT WHICH TIME DETAILS WILL BE GIVEN ON DESIGN AND OPERATION, AND NUMEROUS PHOTOGRAPHS OF THE TELEMETERING AND CONTROL EQUIPMENT WILL BE PRESENTED.



of telephone cable, which includes cheek points, telephones, and controllers. Cables extend from the various control points on the system and transmit to the central dispatcher's board. The control system includes both Bristol and Foxboro equipment—depending upon the pressure involved. Both instruments provide means whereby the dispatcher can raise or lower the pressure being maintained by in-

dividual regulators throughout the system. Panel board instruments show pressures at each check point, so that need for and results of each remotely actuated change in controlled pressure may be observed.

Experience so far with the telemetering and control system has proven highly satisfactory, and additional improvements in service and economy will result when the overall plan is completed.

Case 18-Alabama Textile Mill

#### Size Cooking Control System Effects 25% Saving

INSTALLATION of the illustrated electronic size cooking control systems at Avondale Mills, Sylacauga, Alabama, has made it possible to reduce the size formula 25 per cent on light sets. Dollarwise, the saving is such that, with production at an average of ten batches a day, one system will completely pay for itself in less than ninety days.

Additional benefits reported by E. P. La Voie, Overseer Clothroom and Finishing, are: (1) increased size uniformity from batch to batch, (2) better utilization of time of skilled operators, (3) increased production and (4) eliminary

nation of "boilover".

Each of the two control systems illustrated includes a Brown ElectroniK air operated controller, timer, push-buttons and necessary relays. The systems control two cooking kettles which supply finishing dressing or back-fill size to a tenter unit. Size is cooked and stored in the same kettle, no storage kettles being employed.

Once the controls are adjusted to the desired cooking and storage temperatures, and cooking time, no further adjustment is necessary until the composition is changed.

Case 19-Texas

#### Long Poles for Short Wave

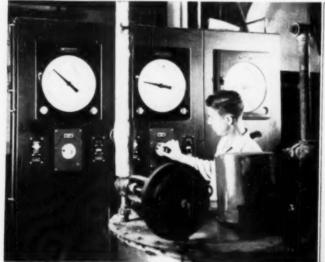
SHORT wave antennas have taken to the tall timber in Texas—eight pieces of timber taller than a ten-story building.

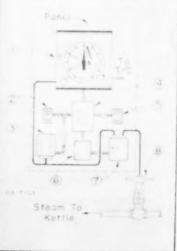
Eight 120-foot Douglas fir poles recently were pressure treated with creosote at the Houston plant of Koppers Company, Inc., and dispatched to short-wave antenna sites of the Central Power and Light Company of Corpus Christi.

Each of the king-size poles will be sunk 18 feet in the ground at separate sites in southern Texas after being trucked from Houston under a special permit from the Texas Department of Highways, which regulates the trucking of any length over 35 feet through an incorporated town.

In Koppers' huge pressure cylinder where the coal tar preservative is pushed deep into the wood, the 120-foot poles required the space normally allotted to three sets of standard 35-foot poles.

ELECTRONIC SIZE COOKING AND STORAGE PANELS AT AVONDALE MILLS, SYLACAUGA, ALA. INSTRUMENT TO EXTREME RIGHT CONTROLS TEMPERATURE OF SOLUTION IN TENTER PAD TANK. SCHEMATIC DRAWING SHOWS ARRANGEMENT OF CONTROL ELEMENTS IN LIZE COOKING AND STORAGE CONTROL SYSTEM.





Section 3

# **POWER AND STEAM GENERATION**

Case Studies

Self-cleaning condenser..control board design..vertical feed pumps..refractory installations..highlighting condenser leakage..increased water output from existing zeolite softener

Case 20-North Carolina Bleachery

#### "Nine to One" in Boilers Means Economy

By W. H. Fisher

Plant Engineer
Kerr Bleaching & Finishing Works,
Inc., Concord, North Carolina

WITH steady pressure, ample steam, and dependable operation demonstrated by the new boiler plant, finishing plant production in both quantity and quality has reached new highs, and accuracy of scheduling orders has greatly improved. Fuel savings in the neighborhood of 40 per cent have been experienced, as well as a substantial reduction in payroll and maintenance cost.

The old steam plant had 9 HRT boilers which were shut down when the new steam plant with one boiler was placed in operation.

Changing from "Nine to One" has meant real economy.

The new steam generating unit is rated at 60,000 pounds of steam per hour continuously, and 70,000 pounds per hour for a 2 hour peak.

The steam generating unit consist of a Babcock & Wilcox Integral-Furnace Boiler, FJ18-52, Detroit Four-feeder RotoStoker, B&W Oil & Gas Burners, B&W Tubular Type Airheater, Western Precipitation Corporation's Dust Collector, and Sturtevant Induced and Forced Draft Fans, Diamond Soot Blowers,

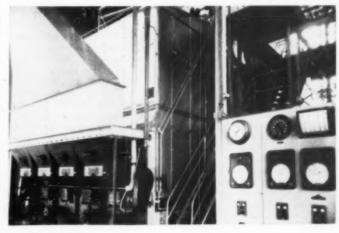
and Bailey Meters and Pneumatic Combustion Control, The boiler is designed for burning coal, oil or gas without changes to firing equipment.

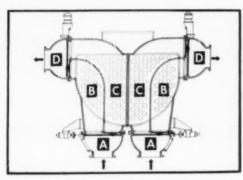
Coal handling equipment includes a track hopper from which the coal is conveyed 75 ft through an underground tunnel to an elevator located inside a 250 ton tile silo. Coal is elevated to the 50 ton live-storage shelf which spills over into the 200 ton dead storage after it is filled. Coal from the live-storage shelf flows by gravity to a

Richardson Automatic Coal Scale which discharges into a conveyor to the coal distributor on the top of an extended stoker hopper. All of the equipment is dust tight, Outside storage of the coal is near the silo, The coal handling equipment was manufactured by the Stephens-Adamson Manufacturing Company.

In comparison with the old plant, the new boiler plant has resulted in a 50 per cent increase in capacity in 46 per cent less floor space, a 67 per cent savings in labor and 40 per cent savings in fuel.

A complete description with illustrations will appear in the November issue of SP&I.





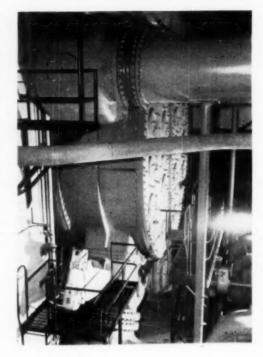
Here's How the "REVERSE FLOW" Principle Works

Both halves of this Dual Bank Condenser work the same, but independently of each other.

Left side: Water enters divided water box at valve chamber A, with left port open. It flows through pass B to end of condenser, back through pass C and out through upper port of D.

Right side: Flow is reversed: Valves at inlet A and discharge D are changed to permit water to flow through C and back through B in the opposite direction, then out through lower port of D.

THE PHOTOGRAPH SHOWS THE LOWER VALVE FOR REVERSING FLOW THROUGH CONDENSER.



#### Case 21-Georgia Power Plant

#### **Self-Cleaning Condenser Reduces Down Time**

EORGIA Power Company's Plant Atkinson, near Atlanta, draws circulating water from the Chattahoochee River. The inevitable sand, gravel, twigs, and leaves formerly clogged condenser tubes and tube sheets in a matter of hours. Before the installation of a C. H. Wheeler Reverse Flow "Self-Cleaning" Condenser, it was a two to three hour job every day to remove anywhere from 1/2 to 2 yards of debris by hand. During this time it was necessary to drop the load on the turbine to about half, while operating against excessive back pressure.

Since September 5, 1949, when a C. H. Wheeler "Self-Cleaning" Condenser was installed, there hasn't been a single shut-down for cleaning. The Reverse Flow mechanism works flawlessly 24 hours a day, with 70,000 gallons per minute of river water passing through. The only cleaning is done by means of the electrically operated valves that reverse the flow of water through the condenser without interfering in any way

with plant operation. This is done as often as necessary, and in a matter of minutes.

Through eliminating down-time for condenser cleaning, approximately **one month** of full capacity operation is added to the service of one of the four 60,000 kw turbo-generators in this 240,000 kw plant.

A complete description will appear in Nov. S.P.I.

#### Case 22-Florida Woodworking Plant

#### Improving Boiler Efficiency

OVER a term of many years, one of the largest plants in Florida specializing in the production of fruit crates and vegetable hampers had been making every effort to overcome scale troubles in their two 500 hp Casey-Hedges boilers. This condition was greatly aggravated due to use of artesian well water heavily impregnated with minerals and salt. Foaming and priming were exceedingly bad and frequent repairs to their several engines due to water damage were necessary.

After trying upward of twenty chemical compounds, H. K. Wilson,

of St. Petersburg, state representative of the American Sand-Banum Co. was called on to show what could be done with Sand-Banum. Enough Sand-Banum was supplied to permit a three months test. The foaming and priming was stopped in two or three days and the scale began to disappear.

The original schedule called for boiler washing every Sunday with a cost of \$13.00 for labor and gaskets. During the week, the cost of chemicals was approximately \$37.50 with an added \$12.00 for salt to regenerate the softener which was later discontinued

without loss of efficiency. As they became better acquainted with the operation of Sand-Banum, the washing periods were extended to six and later eight weeks, reducing the cost of maintenance from \$72.50 per week to less than \$30.00. While they continued to turbine the tubes at each washing, not over a gallon of scale was removed per boiler, which is negligible for a

boiler of that size.

These boilers are operated on wet mill waste, and to maintain pressure they were spraying about 4,000 gallons of Bunker C fuel oil onto the fires per week. But now, since instructing the firemen in lowering the draft and keeping the fire entirely in the furnace, they were able to eliminate use of oil entirely.

Case 23-Delaware Utility Company

# Pressure Sensitive Tape Used in Control Board Design

THE dispatch room in the Delaware Power and Light Company's new Service Building in Wilmington, Delaware, is dominated by a huge system operation board arranged in an arc facing desks of two operators.

The entire curving board which measures about 8 ft by 30 ft is made up of a series of 16-in, by 24-in, panels of white "Lamicoid" board. These panels are held in place with small screws in each corner. The white surface presents a perfect background for the delineation of lines, substations, generators, circuit breakers, etc.

All of the lines, the various symbols, the names of industrial customers, and stations as shown on this board has been printed on pressure-sensitive tape which was applied to the panels before assembly of the entire board, This tape was all printed to specifications by Topflight Tape Company of York, Pennsylvania.

#### Construction

When plans were being made for the new board, D. T. Eastburn, assistant superintendent of stations, delegated the designing and construction to A. A. Williams, assistant to the superintendent of stations, and C. A. Crozier, senior

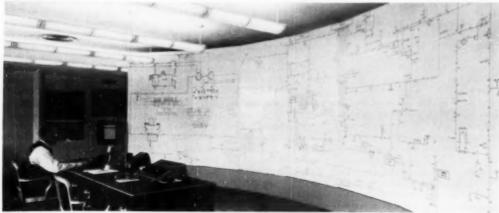
draftsman. Mr. Crozier was the designer of this job. Selection of a plastic board and pressure - sensitive tape for the markings was made for the following reasons:

- Cost—about one-fifth of the cost of the alternate construction considered.
- Flexibility—tape can be removed or new tape added when changes or additions are needed without disfiguring surface of board.
- Time—changes can be made right in the building, with less delay than if panels would have to be sent outside.

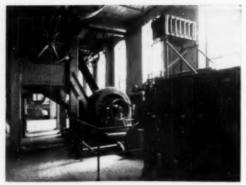
The entire assembly of the master board was done by Delaware Power & Light Company personnel. The tape, supplied in different colors for various lines and installations, was cut and applied with drafting room care and supervision. Holes were drilled after tape was applied for installation of indicating lamps and colored pins, and when the entire board was erected, each panel fitted in perfectly-continuing lines running across two or more panels joined exactly and the effect is that of a greatly enlarged drawing board design.











COST OF POWER TO CRUSH A TON OF SEED AT THIS BIRMINGHAM, ALABAMA, COTTON OIL PLANT WAS REDUCED APPROXIMATELY 50 PER CENT IN ONE YEAR BY A CHANGE TO PURCHASED ELECTRIC POWER. HERE ARE THE ENGINE AND GENERATOR DISCUSSED IN THIS BRIEF BETTER PRODUCTION CASE HISTORY.

Case 24—Alabama Cotton Oil Mill

#### **Improved Power and Steam Supply**

By E. D. Scott

Industrial Engineer Birmingham Electric Company

THE Farmers & Ginners Cotton Oil Company, Birmingham, Alabama operates a cotton seed oil mill capable of crushing 160 to 170 tons of seed per 24-hour day. In addition, the company operates a fiber plant that takes the remaining fibers from the hulls. Some 300 hp is required to supply the power requirements for five linters in the fiber mill. In order to furnish the power requirements for the oil mill a 950 hp, 48" stroke, 24" bore Corliss steam engine was installed in 1928.

In 1934, at the depth of the depression, it was decided for economic reasons to install a 450 hp water tube boiler along with a 400 kw generator which was belted to the main line shaft to furnish power for the fiber mill and other miscellaneous motors in the plant. Only a nominal amount of power and lighting service was then purchased.

The power company representative continued contacts with the management of Farmers & Ginners during the time the engine was in service. Immediately after the war its management indicated interest in taking its power requirements from the utility. After tests were made to determine the amount of generation and cost data were submitted, it was decided early in 1946 to shut down the 400 kw generator and transfer the plant electric load to the utility. During the down season in the summer of 1949 a 406 hp slip ring induction motor replaced the steam engine, being belted to the main line shaft from the former location of the generator.

At the same time a 100 hp Eric City Iron Works, Economic type. gas-fired boiler was installed for the purpose of providing steam to the cotton seed cookers, also for space heating for the office and wherever heating is required. This boiler was equipped with automatic furnace draft control supplied by The Hays Corporation. A Hays draft gauge was also installed to indicate the furnace draft being maintained. Also installed was a Kisco condensate return system. together with a Kisco boiler water level control. This equipment serves the purpose of an automatic feedwater regulator by controlling the operation of the boiler feed pump to maintain a uniform water level in the boiler. The system also utilizes the condensate from the cookers, returning this to the boiler. For make-up water to the condensate tank, circulating water from the air compressors, which was formerly wasted, is now utilized as part of the boiler feedwater. This equipment has served to increase the operating efficiency of the plant.

Changes and improvements were made under the direction of L. R. Camp, consulting engineer for the Cotton Oil Company. The replacement of the steam engine with purchased electric power service was influenced by prolonged labor unrest in the coal fields which resulted in uncertain coal supply and to an increase of approximately 300% in the cost of coal during the previous several years.

One interesting feature of providing the substation capacity necessary to serve the 900 kw load was the type of substation design. No space was available to locate the transformers on the ground, so it was decided to purchase three 333 kva light weight transformers and install them on a two-pole station located between the sidewalk and curb directly underneath existing primary feeders.

The savings resulting from the change to purchased electric power service during the first year were highly gratifying to the management of Farmers & Ginners Cotton Oil Company inasmuch as the cost of power to crush a ton of see! was reduced approximately 50%.

#### Case 25—Texas Municipal Power Plant

#### **Vertical Feed Pumps**

THE City of Austin, Texas, which operates its own public utilities, recently constructed an ultra-modern steam power plant consisting of two 20,000 kw turbine driven generator units.

At design load, each of the two boilers requires 475 gpm of feedwater at 350 F. The boiler feed pumps are designed to pump 235 F water against a total dynamic head of 2560 ft at design conditions.

Both horizontal and vertical boiler feedwater pumps of the double case type were considered. The proposed arrangement contemplated the use of two horizontal pumping units per boiler (one operating and one standby) or three low-capacity, high pressure, vertical pumping units (two operating and one standby).

It was desired to have the maximum pump efficiency so located with respect to the rated pump capacity that the most economical over-all performance could be realized under the following expected conditions:

#### **Operating Conditions**

#### Hrs Per Yr Horiz. Pump Vert. Pump

	sanstat a much	
500	475	238
500	410	205
3000	380	190
2000	320	160
2000	220	110

The first cost of four horizontal pumping units with one complete spare rotating element and stationary parts amounted to approximately 15 per cent more than the first cost of six vertical units with one complete spare rotating element and stationary parts.

The flexibility of operation, using three low-capacity, high pressure, high efficiency, vertical multistage Hydropress type centrifugal pumps for each boiler, was even more important than the savings in first cost. Evaluations were based on the table of expected operations shown above, using a power cost of .003/kwh and fixed charges at 15 per cent.

The savings in floor space and

simple foundation requirements were also valuable factors in the selection of the vertical Hydropress type pumps. Comparative maintenance costs were considered to be minimized in the vertically constructed pumps. They are easily dismantled and reassembled. There is only one stuffing box and since it operates under suction pressure, the packing problem is not difficult.

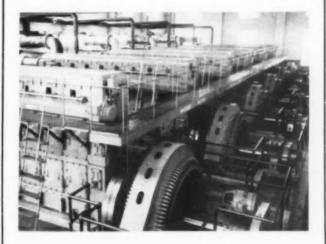
Courtesy, Byron Jackson Co.

# Case 26 More Diesel Power North Carolina for New Bern. N. C.

THE City of New Bern, North Carolina, recently added a sixth unit to their municipally owned diesel-electric power plant. The plant, completed in 1948 at a cost of \$600,000, was originally built with five units.

New Bern was among the first cities in the United States to own and operate an electric power plant. Prior to 1948, the city had used turbine-driven generators. In 1947, although operating the equipment available, part of the city's electrical power needs had to be purchased. It was this situation which led to the building of the new plant. Economic studies were made to determine the relative merits and costs of several types of power supply. Results showed that a diesel-electric plant would most nearly solve the city's power problems. A contract was let for five National Supply Company Superior supercharged diesels to develop 1000 kw each.

The recently added sixth engine, like the five originally installed, is a supercharged Superior. It has eight cylinders of 14½-inch bore and 20-inch stroke and is equipped with oil cooled pistons. Woodward hydraulic governor, duplex fuel oil filter, automatic alarm and emergency shut-down systems, and many other modern features. The lubricating system is a force-feed, dry-sump type with a rotary pump unit mounted at the control end of the engine and driven by silent roller chain from the crankshaft. Lubricating oil cooler is of the shell and tube type.



#### Change to Oil Plus Combustion Control Saves 86100 in First Year

#### By Henry J. Ward

Superintendent Chas. S. Walton & Co. Baltimore, Maryland

E'VE found that big savings are possible in small boiler plants. Relatively speaking, modern combustion equipment and progressive engineering thinking pay off just as handsomely in the small installations as in the large central stations.

Our boiler plant consists of two 125 hp, hrt, brick set boilers arranged in a battery. We operate at 60 psi, 24 hours a day, 7 days a week. However, most of the load is required during an eight hour per day period, 6 days a week.

#### Burner Conversion

A few years ago, we installed Faber oil burners to replace hand firing of coal. The burners used Bunker C oil with natural draft. The improvement in working

conditions under this oil firing arrangement brought immediate savings. Previously, we had found it impossible to hire a fourth fireman and were having difficulty keeping the three regular firemen on the job. With the elimination of the coal pile and its attendant dirt and back-breaking shoveling. we were able not only to keep our regular firemen satisfied but to hire a fourth fireman. We then rescheduled our labor time and eliminated the overtime and double time on Sunday, thus reducing our operating cost approximately \$1500.00 a year.

In addition, we found that we did not have to replace refractory every year. This saving amounted to approximately \$1000.00 per year.

#### Combustion Control Systems

A year later we installed a Hays combustion control system, with draft gages and CO<sub>2</sub> analyz-

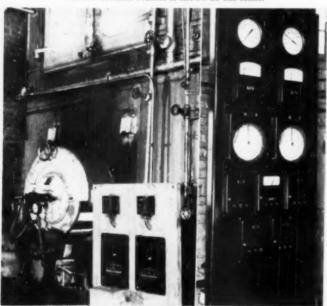
ers. From an investment standpoint, this installation has worked out even better than the burner conversion. For a ten months period before the control installation, we consumed 573,000 gallons of oil. For the same period a year later, after installation of the Hays controls, we only consumed 513,000 gallons. Since there have been some small increases in steam demand, we feel that these figures are on the conservative side.

At today's prices, this fuel saving of 60,000 gallons amounts to approximately \$3600.00. This sum is more than the installation cost. A 100% return from an investment in the first year is what we call good business.

The Hays automatic combustion controls have also helped us to achieve a secondary saving. With the fully automatic system, we have eliminated the night watchman and have the night fireman punch the clock on regular rounds.

Maintenance has been small—in fact, nothing except chemical and some small parts for the CO<sub>2</sub> analyzer. Therefore, our savings are continuing and should do so for years

THIS SMALL BOILER PLANT ACHIEVED LARGE SAVINGS IN LABOR, REFRAC-TORIES, AND FUEL THROUGH USE OF MODERN EQUIPMENT. HAYS COM-BUSTION CONTROL SYSTEM IS SHOWN AT THE RIGHT.



Case 28-Tenn, and Mo.

#### Successful Refractory Installations

No single refractory material has the universal properties necessary to meet the varied conditions present in modern industrial equipment. Each industry presents its own set of characteristics—conditions peculiar to it alone. There are literally dozens of so-called specialty refractories, Each is designed to fit specific requirements and many of them are recommended for complete furnace linings.

Concurrent with the improvement of specialty products themselves and their methods of manufacture has been the even greater enlargement of their field of application through the development

of new and ingenious methods of construction. Successful refractory installations must meet the varying service conditions in different sections of industrial heating and power units. It is both practical and economical to install a specific material to meet the conditions in each section. Complete monolithic linings, utilizing the proper refractory in each section of the installation, can be installed quickly and easily. In monolithic construction, there are no exposed joints subject to attack by flame or slag. The linings remain air-tight and do not bulge.

#### Case Histories

Rapidly changing conditions in the dyehouse of a Dyersburg, Tennessee, manufacturer caused the demand for steam to jump from 25% of the boiler rating to 150% and sometimes 200% in a matter of minutes. Such severe service conditions always necessitated relining the boiler after 1 year's service.

Two 204 hp straight tube boilers were relined with A. P. Green Fire Brick Company Monolithic Linings. The Vice President of the company reports that only minor repairs were needed in 8 years of service.

A leading Kansas City manufacturer reports that the A. P. Green Monolithic lining installed in his oil-fired 3-drum low head boiler has given 3 times the length of service formerly obtained from fire-brick, Quality construction pays for itself in longer service life.



lift the boiler and beams.

JONATHAN: But doesn't that same wall go up inside in front of the beams and also rest on top of the beams?

LEM: Why sure, that's even the way my grandpa used to build them. If it was good enough for him, it's good enough for me.

JONATHAN: What happens when that part of the wall in front of the beams keeps on going up and that part of the wall that rests on the beams can't?

LEM: That is what tips the wall outward and that is what makes more work for me rebuilding the wall. The only fellow that gets mad is the Boss who pays my wages and the fuel bills, but I don't see why a few cracks is any of his business.

Courtesy George P. Reintjes Co., Kansas City, Mo.

Case 29-

#### Side Wall Troubles Discussed

WE talk about the weather, but nobody does anything about it. The same is true of the upper side walls of Stirling Boilers. Most engineers in the South will tell you there is more fact than fiction in the conversation of our cartoon characters:

JONATHAN: Where does that soot on top of the boiler come from?

LEM: From the cracks between the upper side walls and the roof tube covering.

JONATHAN: Why don't you fix those

LEM: It's too dirty up there, so I

let the boiler washer do it. Every time he puts packing in the cracks, the wall moves out further. It don't do no good.

JONATHAN: Are other boilers like that at the top?

LEM: Why sure, nobody pays any attention to it because they can't see the cracks from the floor. It's when the walls fall down that the boss asks questions.

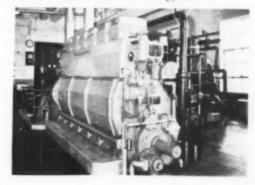
Jonathan: Why do you leave those big cracks between the side walls and the drum supporting beams? Lem: If we didn't, when the walls expand upward the wall would

Case 30-Oklahoma Municipal Plant

#### City Gets Low Cost Power from Diesel Engine

OW cost operation and practically double the power capacity were the end result of installing a Nordberg Duafuel Engine in the municipally-owned Diesel electric power plant at Okeene, Oklanoma. Using natural gas as fuel, this engine saves over \$1,000 a month in fuel and lube costs compared to the three older oil-burning Diesels in the plant. The Nordberg Duafuel Engine has an output of 590 kw compared to combined total 704 kw output of the other three Diesel engines.

The Nordberg gas-burning engine is a four cycle, six-cylinder supercharged Duafuel unit of 13" bore and 161/2" stroke, rated at 840 hp at 450 rpm.



#### **Highlighting Condenser Leakage**

#### By H. J. Guillory

Plant Superintendent Coughlin Generating Station Central Louisiana Electric Company

OUGHLIN Generating Station of the Central Louisiana Electric Company, consists of 3 condensing turbines, two 7500 kw and one 10,000 kw, operating on steam at 600 psig and 825 F.T.T. from 3 steam generating units, two 90,000 lb per hr and one 120,000 lb per hr. The plant is situated in Evangeline Parish on Bayou Cocodrie and water from this stream is used for circulation through our surface condensers. During a recent inspection of the two 7500 kw turbines, it was found that stages 9 through 13 had a deposit of nonsoluble siliceous scale that proved very troublesome to remove from the blading.

After this inspection, we began searching for a possible source of silica contamination in our condensate returns. All indications and tests pointed to the condenser as the only possible source. Conventional methods such as hydrostatic tests and candling failed to show any inleakage of circulating water into the steam side of the condenser. Moreover, both of these methods consume quite a bit of time and later events proved them to be unsatisfactory for detecting small leaks.

As we were getting nowhere, National Aluminate Corporation, our water consultants, suggested that we use a mixture of Calcocid Uranine B4315 and water in the steam side of the condenser and search the outside of the tubes and tube sheets with an Ultra-violet lamp for possible leaks.

- Calcocid Uranine B4315. This
  material is a fluorescent dye
  manufactured by the Calco Division of the American Cyanamid Corporation and may be
  obtained from them at \$3.05
  per pound. It is neither corrosive nor injurious to personnel
  or equipment.
- 2. A suitable bucket for mixing

the Uranine, which is a powder, with water.

- An air hose for agitation of the water in the hotwell to insure thorough mixing.
- One Catalog No. 1910 Ultra-Violet "Black Light". This may be obtained from the Burton Manufacturing Company, 3855 N. Lincoln Avenue in Chicago for \$18.00. The light consists of two 4-watt General Electric tubes mounted side by side in suitable reflector and operate on 110 volts a-c.
- A tarpaulin or other means of darkening water boxes.

To conduct a test, the machine is shut down after which the manhole on the exhaust hood is removed and the steam side of the condenser is filled with any water not containing sediment to not less than a foot above the tubes. The powdered Uranine is then mixed with water in a bucket and dumped into the steam space of the condenser. The amount of Uranine required is about one pound per 7,000 gallons of water. To insure thorough mixing of the Uranine and water an air hose is lowered to the bottom of the hotwell and the water is agitated with air for

a few minutes.

Following the addition of Uranine and thorough mixing of the solution, personnel then enter the water boxes with the Ultra-Violet lamp described above and the ends of the tube sheets are darkened by hanging a tarpaulin over the openings in the water boxes. The black light is then directed at each tube in the condenser, starting at the top and going from tube to tube horizontally until one row is examined and then doing the same to each successive row. If a small amount of the solution containing Uranine seeps through it will show up by pronounced fluorescense at the point of leakage. Any leaks that are found are stopped and the tube sheet is washed with water in order to get rid of any Uranine-containing solution that may have run down from the leak above it and the remaining rows of tubes are examined.

The actual examination of the tube sheet with the Ultra-violet light requires about 15 minutes. The amount of time required for the filling of the steam side of the condenser with water depends, of course, on the size of the condenser and the equipment available for pumping water into it. Small leaks that we had been unable to find by previous methods showed up readily under the Ultra-violet light. In addition, fewer men are used than in other methods.

#### Case 32-Southern Petroleum Company

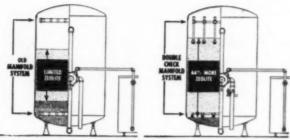
#### Increased Water Output from Existing Zeolite Softener

PACED with a production problem calling for additional soft water a southern petroleum company solved the problem by modernizing their existing zeolite water softener instead of purchasing another unit.

It is quite common to find that older type water softeners lose a considerable amount of zeolite through the years. In this case, it was found that the decreased capacity was due in part to such zeolite loss. Furthermore, the zeolite in the softener was a low capacity type, and was somewhat deteriorated. A marked decrease

in soft water output was the re-

The soft water shortage was quickly remedied by taking two low-cost modernization steps. First the old, low-capacity zeolite was replaced with new high capacity zeolite capable of softening more than twice as much water per regeneration. Also, in addition to refilling the softener to its original level, it was found possible to add a far greater amount of zeolite by installing a new "Double-Check" type distributor—collector manifold system in place of the existing manifold arrangement. The upper



LEFT: WITH OLD MANIFOLD SYSTEM, WATER SOFTENER ACCOMMODATED ONLY A LIMITED AMOUNT OF ZEOLITE.

RIGHT: WITH ELGIN "DOUBLE CHECK" MANIFOLD SYSTEM, WATER SOFTENER ACCOMMODATES 44% MORE ZEOLITE.

and lower system of check valves of this type manifold permit a water softener to accommodate additional zeolite and at the same time guards against zeolite loss. Thus, with a large (deeper) bed of high capacity zeolite, the soft water output of the existing softener was more than trippled.

The modernization steps which were quickly made at nominal expense, solved the soft water production shortage; eliminated the necessity for expensive new equipment; and overcame the need for future costly zeolite replacements because the new manifold system prevents zeolite escape.

This is a typical example of what can be done with existing zeolite water softener equipment to solve the problem of soft water shortage and zeolite loss. The modernization work was carried out under the direction of the Elgin Softener Corporation, Elgin, III.

Case 33-Florida Brewery

#### Linings Save 400 Gallons of Oil Per Square Foot of Wall

DESIGNING for better production at the Jax Brewing Co., of Jacksonville, Fla., started at the heart of the process equipment—in the boiler furnace.

New economies were visualized by the management of this concern more than eleven years ago when their power plant was in the planning stage. Basing a decision on sound engineering principles Jax Brewing helped pioneer one of the most important developments in refractory boiler settings up to that time. Considered a departure from standard practice in 1939, Jax Brewing relied on the ability of a relatively new lightweight insulating firebrick, made of Georgia Kaolin, to withstand the rigorous conditions anticipated in the oil fired furnace of a 372 hp Stirling H Type boiler.

The advantages of using insulating firebrick walls had previously been illustrated in other types of industrial furnaces, but the manner in which they would stand up in a boiler furnace operating at 200 per cent of rating was a matter which could only be proven by service. Now, after eleven years of top notch performance the lining is being renewed and the original estimates of operating economies and service life have more than been confirmed.

The insulating firebrick, Babcock and Wilcox K-28, is directly exposed to the flame and is backed by 4½-in, of firebrick and 8-in, of red brick. The amount of heat stored in a wall of this construction at operating temperature is approximately one-third of that which would be stored in the more common 13½-in. firebrick plus 8-in, red brick wall. In terms of fuel, this means a saving of approximately .55 gallons of oil for

every square foot of furnace wall every time this boiler is started up after a shutdown.

Operating personnel also share in the advantages from this installation, since the casing of the Jax Brewing boiler furnace is 115 degrees cooler than casings of comparable firebrick furnaces. From this feature, management saves approximately .68 gallons of oil per square foot of furnace wall for every week this boiler is in operation. Over the eleven year life span of the B&W K-28 lining, upwards of 400 gallons of oil/sq ft of wall area are estimated to have been saved.

In addition, untold hours have been saved in operating time with this unit because of the more rapid response of the boiler to changes in load demand. This is brought about because in the event of a sudden need for higher steam flow, the higher temperature desired in the furnace is attained almost instantaneously through the faster rate at which the insulating firebrick walls heat up. This provides for the boiler surface an immediate source of heat which would otherwise not be available until after considerable quantities had been soaked up by heat absorbing heavy firebrick walls. Conversely, when load demand drops, furnace temperatures are lowered more rapidly and popping of safety valves is held to a minimum, Time required to place the boiler on the line after a shutdown is noticeably decreased.

Advantages not originally anticipated have also been discovered to have accrued from the choice of this modern wall design. Comparison with other units shows that there is no opening of cracks in K-28 lined settings, such as have plagued operators of firebrick lined furnaces for years. This eliminates continual pointing up of brickwork and by reduction of air infiltration, insures efficient operation with low excess air.

Throughout the South, dozens of similarly designed units have since been installed. Original estimates made by the engineers of Jax Brewing have been further confirmed since other linings of K-28 have lasted a minimum of eight or nine years and have returned original investments many times over.

#### **Hogged Fuel Solves Problem**

A FURNITURE factory is one of the most difficult of Southern industries in which to balance fuel available with fuel demand. There is either too much fuel or too little. In the summer,



HOG IS FED WITH WASTE WOOD FROM THIS HOPPER LOCATED ON FLOOR ABOVE HOG.

most furniture plants find all of their wood bins and sawdust storage filled to overflowing and they give it to anyone who will haul it away. In the winter, with the increased heating load, there is a scarcity of wood, and coal must be purchased.

That pretty well describes the conditions at the Myrtle Desk Co., of High Point, N. C., until they found a solution two years ago. Until that time, they had been burning slabs of waste wood in their boilers. Combustion conditions were poor, stacks smoked, and worst of all, they had to burn ten carloads of coal every winter.

#### **Equipment Installation**

As a solution to the problem, they installed a wood hog, manufactured by the American Pulverizer Co. Into this they dumped all of their waste wood, grinding it to heavy splinters. From the pulverizer, this hogged wood is blown to a pair of separators, along with all of the sawdust produced in the plant. This combination is stored in a large cement silo.

A screw conveyor, with a Reeves drive, is located at the base of this silo, and delivers the fuel

CONCRETE STORAGE BIN FOR BAW-DUST AND HOGGED WOOD AT THE MYRTLE DESK CO., HIGH POINT, N. C.

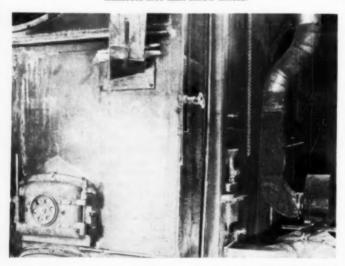
to a fan feeding the boilers. Operation of this fan is controlled by a Mercoid switch operated in accordance with fluctuation of steam pressure. The Combustion Engineering Co. boilers, one of which is used only for standby, are both fairly new.

The master mechanic at Myrtle designed the feed system and the grates. He removed the herringbone grates with which the boiler was equipped and replaced them with a flat, stationary grate for which the boiler was equipped and replaced them with a flat, stationary grate for which he had the blocks cast. It is supported by the same supports which held the herringbone grates, but it is installed so as to be air tight along all edges. Small (3/16-in.) holes are drilled on about one inch centers through all the grate blocks.

A forced draft fan has been installed to blow into the ash pit area below the grate, and this air comes up through all the small holes in the grate. This has resulted in excellent conditions for burning sawdust and hogged wood.

The feed of the fuel is from one corner of the boiler at a height of about 5 ft above the grate. Most of the wood burns before it reaches the grate, and the rest burns in the excellent air supply on the grate. There is no fuel bed in the true sense, only a fine layer of burning fuel through which air

HOGGED FUEL IS FED INTO BOILER THROUGH DUCT IN UPPER CENTER. FORCED DRAFT FAN AT RIGHT DRAWS AIR FROM TOP OF BOILER ROOM AND EXHAUSTS INTO AREA BELOW GRATES.



is rushing, perforating the fuel in the same pattern as the grate,

#### Production Improvement

The best proof of improvement lies in the fact that in the past two years, no coal has been burned, and this is the result of nothing more than increased boiler efficiency of hogged fuel and saw-dust compared with slab wood. The large silo offers enough storage space to very nearly take care of excess fuel in the summer. The stack is now giving off only a faint, white haze, while the stack

gases of several nearby furniture factories are black and heavy. The chart record of steam pressure looks almost as if the line were drawn with a compass—and that is no exaggeration.

Ten carloads of coal per winter is no small saving.

#### Case 35-North Carolina Textile

#### **Steam Accumulator Operation**

A N important economic gain was effected by the installation of a steam accumulator at the new nylon preboarding plant of Hanes Hosiery Mills in Winston-Salem, North Carolina. Lockwood Greene Engineers, Inc., were the engineers on this project.

As shown by measurements of steam flow conditions both before and after its application, heat insulation contributed substantially to steam-handling efficiency. Also, by allowing only a minimum of heat to escape into the basement cafeteria, where the accumulator piping is located, insulation on the piping is keeping ventilating requirements to a minimum.

#### Steam Demand

The engineers, who designed the steam supply system for the preboarding machines, as well as the building to house them, investigated the steam demand and found that there was a theoretical instantaneous load of approximately 93 .-600 lb per hr, if all the machines operated in synchronism. However, average flow to the machines figured about 7,200 per hr. or less than one-tenth of the instantaneous demand. Also, it was necessary to reduce the boiler steam from 130 psig to 40 psig, the process pressure, and still control the flow from the instantaneous maximum to an almost negligible amount at night when machines are down.

To meet these demands, the steam generating and consuming departments were made independent of each other by means of the steam accumulator which operates on the principle of storing the heat energy of steam in a large volume of water under pressure and releasing this energy in the form of steam when the pressure is reduced. The accumulator is 6 ft in diameter and 24 ft long. Because of its size, it is mounted outdoors in an areaway near the preboarding room basement. The steam distributing and vent piping, 6 in. in diameter, is located on the ceiling of the basement so that it is below the machines on the floor above.

Variations in steam flow while the preboarding machines were down, shown in Chart No. 1, were due to unsteady conditions before the equipment was insulated.

When the accumulator was insulated, 2 layers of 85% Magnesia block, each 1½ in. thick, were applied and wired on. This amount of insulation, thicker than that generally used for the temperature range involved, was necessary because of the large amount of heatradiating surface of the accumulator and its exposure to the weather. A hard-finish asbestos cement coating, ¼ in. thick was then troweled on. To protect the insulation from the weather, an asphaltic plastic coating, ¼ in, thick when dry, was troweled smooth over the asbestos cement.

For piping, 85% Magnesia, 2-5/16-in. (double standard) thick, was used. It was wired on in two layers, encased in a rosin-sized paper, and finished with an 8-oz sewed canvas jacket. To fit in with the cafeteria colors, the canvas was sized and painted with two coats of mill white paint. The insulation was applied by Starr Davis, Inc., of Greensboro, North Carolina,

CHARTS SHOWING STEAM FLOW BEFORE (LEFT) AND AFTER (RIGHT) INSULATION WAS APPLIED.

CHART NO. 1

CHART NO. 2

# Section 4 — REFRIGERATION AND AIR CONDITIONING

#### Case Studies

Electronic control for refrigeration compressor.. cooling water.. one man ice plant system.. removal of hazardous industrial fumes.. purger ups refrigeration capacity

Case 36-South Carolina Mill

#### **Air Conditioning For Process Controls**

MPORTANT to the mills manufacturing fine hosiery is careful control of temperature and humidity, both from an operation standpoint and employee comfort.

This careful control is achieved by adjusting the speed of the compressor in accordance with humidity and temperature demand. Air from the knitting rooms is balanced through a spray type dehumidifier, where relatively cool water is sprayed against it. This spraying serves not only to fix the temperature of the air, but removes the heat picked up by the air returning from the knitting

rooms and condenses any excess moisture not desired or required for the maintenance of the proper relative humidity needed for fullfashioned knitting. This air is then forced through the duct system to the various knitting rooms and is introduced into the spaces to be conditioned.

Pneumatically operated automatic controls located in the various conditioned areas control the operation of automatic volume dampers and steam coils which are located within the ductwork for ironing out any variations in relative humidity, and tempera-

ture that may occur in the conditioned spaces. In this manner temperature as well as relative humidity are maintained evenly day and night at the point desired by the plant management.

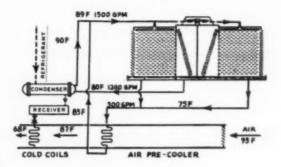
#### Electronic Control

In order to obtain the widest possible range control of speed and the most precise adjustment in the operation of the refrigeration compressor in one South Carolina mill, a Magnetic Drive with electronic control was selected. This magnetically operated adjustable-speed coupling couples the motor to the compressor by magnetic means only. There is no mechanical connection.

The electronic control, called the Regutron, acts as an "air-center" between the Magnetic Drive and compressor. When a temperature decrease is called for, the Regutron senses a needed change and "informs" the Magnetic Drive that higher compressor speed is needed. Instantaneously, the Magnetic Drive comes up to exactly the new speed needed and holds it there without variation. When a temperature increase is needed, the action is the reverse of this. At all times the Regutron stands alert to the slightest temperature and humidity variation and corrects it immediately.

COMPRESSOR EQUIPPED WITH A MAGNETIC DRIVE AND ELECTRIC MACHIN-ERY MFG. Co.'s REGUTRON CONTROL.





Case 37-Georgia Office Building

#### **Cooling Water for Air Conditioning**

ATER from a cooling tower at two temperatures is provided for the air conditioning system in a Georgia office build-

ing: one (75 F) for pre-cooling the air and the other (80 F) for cooling the condenser.

To successfully pre-cool air be-

fore it passes the refrigeration coils the water in the pre-cooler coils must be at or near wet-bulb temperature of air. To cool a condenser an approach of 7F to the wet-bulb temperature is common. Often a separate cooling tower is employed for each service but this is an unnecessary expense because one cross-flow tower can do the job alone.

Since cross-flow cooling towers are louvered along the entire height of the side wall, the dry air cools the water in this area to near the wet-bulb temperature. By building a partition in the basin to collect this extra cold water, this water may be used to serve the pre-cooler while the balance of the water in the collecting basin will cool the condenser.

Courtesy, The Marley Company

Case 38-Texas

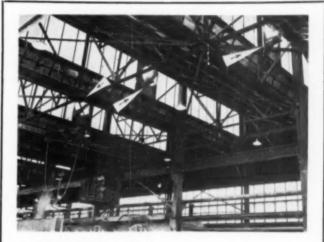
#### One Man Ice Plant System

THE El Paso Ice and Refrigerator Company of El Paso, Texas, makes 100 tons of ice a day from its new one-man system, built late in 1948. The tank is 106 ft 7-in, long by 32 ft wide and is 54-in, deep; it contains 1410 ALL-WELDED cans of 300 lb size, 51in, deep. There are agitators at each end, A whole row of 30 cans is harvested at a time.

The dehydrators comprise two shells, each 24-in. dia. by 15 ft long, with a smaller shell for reheating. The Pennsylvania air compressor supplies 435 cu ft a minute. The three ammonia compressors all have automatic unleaders.

The El Paso Ice and Refrigerator Company has a large plant with several ice making systems, and a considerable staff of men. It has not always been necessary to operate the new 100-ton tank on a one-man basis but it is designed and equipped to be run by one man working one shift when desired. The new ice making system operates with remarkable economy.

Courtesy, Frick Company



Case 39-Aluminum Plant

#### **Hazardous Fumes Removed**

REMOVAL of hazardous industrial fumes is one of the most important problems facing operating men in the processing industries. The illustrations above show how fumes generated during the aluminum ore reduction process in a Southern plant are drawn from the building by a series of 28 motor-driven fans.

Each fan is driven by a 2 hp, 1750 rpm Reliance Electric & Engineering Co. corrosion-resisting motor, which has been specially constructed to operate for extended periods under adverse conditions similar to those pictured here. Reliable operation with a minimum of maintenance is a prime requisite for all equipment which is installed under these or similar circumstances.

#### More Efficient Watch Assembly in Abilene Plant

IR conditioning is proving to be a boon to one of Abilene, Texas', newest industries, the United States Time Corporation plant, where watches and clocks are manufactured.

Frigidaire air conditioning equipment with about 75 tons of refrigerating capacity, installed by the West Texas Utilities Company recently, provides close dust and humidity control - a particularly important factor contributing to the effectiveness of the watch and clock assembly operation.

#### Equipment

All equipment has been installed in a penthouse with dimensions of about 20 by 60 feet, built especially for the purpose of housing the air conditioning machinery. Temperature controls have been installed on the first floor and both heating and cooling can be regulated from that point.

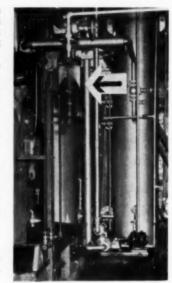
#### **Purger Ups Refrigerating Capacity**

IR in a refrigerating system A acts as a brake. It raises head pressure, reduces capacity and makes compressor work harder and

To eliminate these effects, the Dalton Ice Co., Dalton, Ga., installed an Armstrong Purger on their 60-ton ice-making system. The purger is designed to completely separate air and other noncondensable gases from the refrigerant and discharge them to the atmosphere

With the purger in operation, head pressure dropped 25-30 lb. and power costs dropped appreciably. The compressors operated much more efficiently, making possible the production of two additional tons of ice daily.

ARMSTRONG PURGER INSTALLED ON THE 60 TON ICE-MAKING SYSTEM AT THE DALTON ICE Co., DALTON, GEORGIA.



of six Frigidaire water-cooled re-The equipment proper consists ciprocating compressors with a to-

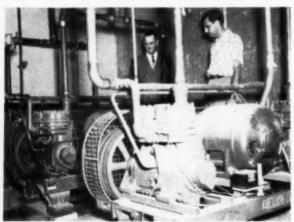
tal refrigerating capacity of 75 tons. Power is supplied by three 25 horsepower electric motors. each driving two compressors. In addition there is a 75 ton condenser and three gas heaters which can be used to warm the buildings.

#### System Operates Automatically

To place the huge cooling system in operation, a switch is closed and two of the compressors are started. In 10 seconds two more Frigidaire compressors start automatically. In 10 more seconds, the remaining two compressors also start operating automatically. This arrangement affords an economic operation with compressors matching the refrigeration load as required.

To change the system from cooling to heating, or from heating to cooling, a double-throw switch is moved from one position to another. Conditioned air is carried throughout the plant by ducts and is discharged from ceiling air distribution outlets.

FRIGIDAIRE WATER-COOLED RECIPROCATING COMPRESSORS WITH APPROXI-MATELY 75 TONS OF REFRIGERATION CAPACITY FOR AIR CONDITIONING IN THE NEW UNITED STATES TIME CORPORATION PLANT IN ABILENE, TEX. THREE 25-HORSEPOWER ELECTRIC MOTORS POWER SIX FRIGIDAIRE COM-PRESSORS. EQUIPMENT IS HOUSED IN A SPECIAL PENTHOUSE WITH DIMEN-SIONS OF ABOUT 20 BY 60 FEET. SHOWN LOOKING OVER THE COMPRESSOR ARRANGEMENT ARE J. E. KUYKENDAHL, LEFT, GENERAL SALES MANAGER OF THE WEST TEXAS UTILITIES COMPANY, WHICH MADE THE INSTALLA-TION, AND F. J. ORINTAS, U. S. TIME CORPORATION PLANT MANAGER.



#### Section 5

# MAINTENANCE AND OPERATION

#### Case Studies

Welding booth design . . silicon carbide wheels for drilling bits .. mobile electric circuits .. snubbers for vibration .. grating and treads . . fluorescent light flickering . . maintenance scaffolds . . anti-corrosive paint . . welding methods . . corrosion problems

Case 42-Kentucky Metalworking

#### Welding Booth Design

NEW welding booth, deplant of Tube Turns, Inc., Louisville, Ky., has proved so satisfac- alkalies. tory that the details of its construction are given here.

#### Design

The four sides of the booth consist of vinyl coated Fiberglas cloth (called Fibrylon), suspended by hooks from a rod frame made to the size of the work area. The cloth is hung in overlapping panels, and easily pushes aside at any point to permit the entrance or removal of the pieces to be welded. It is weighted at the bottom to prevent flapping and clears the floor by about 1 in., which allows air to circulate freely and carry off fumes and heat.

#### Cloth

The noncombustibility of the cloth, and its high tear strength, are only a few of its desirable qualities. It is, in addition, moisture proof, mildew resistant, cleanable, colorfast and durable, doesn't stretch or shrink, and be-

cause of its inorganic composition, signed for use in the main will not rot nor decay. It is also resistant to most acids and

#### Advantages

Advantages offered by the new booth are: Low cost, compared with metal enclosures of the same

size; quick access from any angle; ability to receive large size work without difficulty; portability, and more comfort for the welder.

Commercial glass yarn was introduced about 1943, but originally had several serious drawbacks, including little resistance to flexing and abrasion. A preliminary silicone treatment and various kinds of plastic coatings have since eliminated its objectionable features and added highly useful new ones.

NONCOMBUSTIBLE AND TEAR RESISTANT FIBRYLON FOR WELDING BOOTH ENCLOSURES HAS THE ADVANTAGE OF LOW COST, COMPARED WITH METAL ENCLOSURES OF SAME SIZE. BOOTH DESIGN IS TUBE TURNS, INC., LOUIS-VILLE, KY. THE VINYL COATED FIBERGLAS, FIBRYLON, IS A PRODUCT OF THE HOLTON CORPORATION, NEW ORLEANS.



#### **Drilling Bits Efficiently Maintained**

PROBABLY the most prosperous industry in the Southwest is oil and one of the most important phases of oil production is the drilling operation which taps the crude petroleum reserves deep in the earth.

In recent years drilling operations have been far more productive than ever before because modern drilling equipment, with cemented carbide tipped cutting edges, have made it possible for oilmen to drill faster, deeper and far more economically than they could with older type heads.

#### Silicon Carbide Wheels

Cemented carbide tipped drilling heads are extremely wear-resistant. They are accurately ground with specially selected abrasive wheels to the correct "gag" so that the proper hole diameter can be maintained to accommodate the size of the casing to be used.

When consideration is given to the fact that cemented carbide tipped bits will drill from eight to ten times as long between replacements as older type bits, the savings effected in drilling deep wells become readily apparent. "Green Grit" silicon carbide grinding wheels manufactured by The Carborundum Company are used by drilling-head makers for accurate sharpening of cemented carbide tipped bits.

#### Case 44-Florida Food Processing

#### Mobile Electric Circuits Save for Citrus Industry

A N effective solution has been found to a problem of the fast growing Florida citrus industry. Enormous refrigerated warehouses are used in this industry for storing their processed product, subject to shipping orders. These warehouses are as much as 400 ft long and sometimes two are placed end to end—extending the length of 800 ft. Light must be available in all parts of the building, but the heat generated should be held to a minimum to avoid ex-

cessive refrigeration. Also, power must be available throughout the area for operating portable machines such as stackers, wrappers, etc.

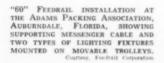
Since handling only takes place in one part of the room at any one time, mobile electric outlets are very advantageous.

The Feedrail system adopted by Adams Packing Association at Auburndale, Florida, has solved the above problem and also results in important savings in installation, operating and maintenance costs.

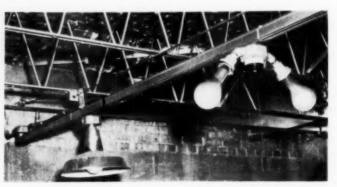
#### Installation

Lighting is supplied through a single run of 60 ampere, 110/220 volt, single-phase Feedrail track above the center aisle of each warehouse at a height of 20 ft. Each track carries several trolleys. to each of which a 4-in, octagonal outlet box is attached. Each outlet box carries two PAR-38 or R-40 lamp holders facing at right angles to the main aisle, one on each side. In the center of each box a 4-position pull chain switch is mounted. The operator of the gasoline powered lift truck can pull a lighting trolley by the chain and roll it along with him to the bay which is to be loaded. He pulls the switch to position No. 1 for lighting the left bay, No. 2 for the right bay, No. 3 for both bays, and No. 4 for both lights off.

A similar installation supplies 250-volt, 3-phase power to electric motors driving the stackers and wrappers. For this service, a single Feedrail run extending the full length of the warehouse provides power at any point through mobile outlets called trolleys.







#### Case 45-Texas

#### **Vibration Stopped**

A COSTLY and dangerous condition in a half million cubic foot gas holder in a large Texas chemical plant was remedied recently by a comparatively simple expedient—control of gas surge that was causing vibration.

Pulsation in the intakes to a number of 1600 hp reciprocating compressors was shaking the holder crown and sides, necessitating frequent welding of the holder plates. This was an extremely dangerous and difficult operation, requiring the services of several men and extra safety precautions because of the danger of fire or explosion of the inflammable contents of the holder.

Burgess-Manning Company engineers were consulted and they decided to make a test. A single compressor was equipped with a gas line "Snubber," and the other compressors were shunted. For these tests the holder was company to the company of the com

pletely isolated and only the compressor equipped with the "Snubber" was taking gas from the holder. Gas line "Snubbers" are designed to "tame" the gas slugs, caused by molecular compression, which pulsate in the line and cause oscillation and vibration.

The "Snubber" was so successful in eliminating vibration that the other compressors also were so equipped, and the company is now considering other installations where vibration and noise are causing danger and discomfort in the plant.

#### Case 46-Tennessee Cement Plant

#### **Grating and Treads Designed for Safety**

WHEN Marquette Cement Manufacturing Company, Nashville, Tenn., planned its remodeling and modernization program, safety was a primary consideration. Accumulation of dust and the resulting slippery surfaces are hazards closely related to the manufacture of cement; therefore the choice of flooring and stair-treads for the plant was of the utmost importance. KERRIGAN Weldforged grating of the

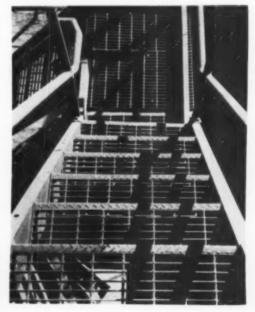
standard K-600 type and KERRI-GAN stair-treads with Superdiamond Nosing were the final choice for the installation. Both grating and stair treads feature Kerrigan continuous-spiral transverse bars (rising slightly above the bearing bars and alternating right and left for additional non-skid protection) Weldforged into the bearing bars to form a high-strength, one-piece grating unit.

This design and process results

in an open-type walkway that sheds dust, lets through a maximum amount of light and air, and makes footing safe on the high stairways and platforms. The photographs of the completed installation show at a glance how important the stairways leading to the high vats are to plant safety—and how the self-cleaning grating (open and dust-free) and the Super-diamond Nosing of the stairtreads contribute to this safety.

Installation of Kerrigan grating and stair treads at the Marquette Cement Manufacturing Company of Nashville, Tenn.





SOUTHERN POWER & INDUSTRY for OCTOBER, 1950

#### Fluorescent Light Flickering Stopped

A SOUTHEASTERN plant engaged in intricate assembly operations found blinking and flickering of burned out fluorescent lamps a major cause of retarded operations, worker fatigue and rejects.

The assembly work called for precision workmanship and consequently perfect, steady lighting at all times. The plant layout and production line set-up made it extremely difficult to replace lamps during hours when the assembly operations were in progress. Frequent work stoppages to permit lamp replacement had proved long and costly.

Recently Magno Tronic Starters, manufactured by Industrial Electronics Corporation of Newark, New Jersey, were installed on test throughout one section of the lighting system. The troublesome blinking of dead lamps was completely eliminated, work output increased considerably and worker morale improved. Magno Tronic Starters are now installed throughout the plant and offices.

These starters automatically shut off current from burned out lamps, conserving power. Additional benefits include ballast protection against overheating and a self starting feature that functions when bad lamps are replaced.

#### READER SERVICE

An important SP&I reader service for this BETTER PRODUC-TION issue is described on page

For more detail regarding these case histories—equipment or evaluation of results—simply circle the number on the reader service coupon and mail to us.

We will request the equipment manufacturers to send the desired information direct to you.

The blinking and flickering of a fluorescent lamp means it has reached the end of its useful life. The flicker is caused by the starter trying to relight the dying lamp. These repeated starting at-

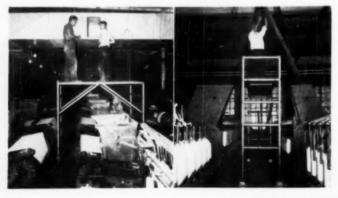
tempts naturally cause the starter to wear out. To avoid this needless wear on the starter contacts; to eliminate annoying blinking at the end of lamp life; and to prevent over-heating or perhaps ruination of the costly ballast, Industrial Electronics Corporation developed a starter that automatically cuts itself out of the circuit. The starter functions like an ordinary conventional starter except when the lamp dies. The repeated starting attempts heat up the bimetallic arm, causing it to automatically shift from one contact to another, thereby opening the starter circuit, eliminating restarting attempts. When a new lamp is installed the starter will automatically return to normal operation by simply allowing the bimetallic strip to cool for a period of 15 seconds. There are no buttons to push, therefore, manual resetting of the starter is not re-

When operating in circuits of normal voltage range they will give dependable performance and outlast many ordinary starters. They have been designed to operate in line voltages of 90 to 130 volts through an ambient temperature range of 30 degrees Fahrenheit to 170 degrees Fahrenheit

Case 48-Alabama Mill

#### Scaffolds Reduce Maintenance Costs

THE superintendent of W. A. Roanoke, Ala., has found that Handley Manufacturing Co.. time and labor saved in main-



tenance have paid for three portable, adjustable, aluminum alloy scaffolds. Additional savings have been made in construction costs, painting, and in replacing lamps throughout the plant.

The lightweight scaffolds can be handled by one man, and they save floor maintenance due to their light load. The equipment can be erected quickly and can be easily moved to the desired position where the job is to be done.

One advantage claimed for the lightweight scaffolds is that production machinery can be kept in operation, and mill operatives are not hindered from performing their duties while the maintenance work is being done. The forementioned scaffolds are made in various sizes and shapes by the Up-Right Scaffolds Division of Up-Right Inc.

#### **Welding Saves Three Months Delay**

THE base of a 1,100-ton, Baldwin-Southwark press, used by the Henry Vogt Machine Company, Louisville, Kentucky, split in two while squaring the ends of sectional headers. The giant hydraulic press, purchased in 1916, is still one of the largest pieces of this kind

operation 3 months earlier than it would have been had a casting been employed.

The finished base is 13 ft long. 7 ft 7-in. wide, and 3 ft 10-in. high. The top plate, not shown here, is made of steel plate 5-in. thick. The bottom and the side

plates are made of 3-in. and 2½-in. thick steel respectively. All parts for this 10-ton box were oxygen-cut to size from firebox quality 70,000 lb tensile strength steel, and welded into place with a Unionmelt UE-37 welding machine.

By fabricating with Unionmelt welding, Mr. Flietz, General Superintendent, estimates that his company has avoided production losses which might very well have run into six figures.



BASE PLATEN FOR 1,100-TON PRESS FABRICATED BY UNIONMELT WELD-ING.

Case 50-Southwestern Utility

#### **Protection From Alkaline Sprays**

Plant Corrosion Problems Solved

A Southwestern Power Company has a switching station composed of a galvanized structure and a large amount of electrical equipment situated between a generating plant and a cooling spray pond from which a strongly alkaline mist is blown over this switching station by the prevailing wind. This corrosive condition is further aggravated by a large number of wind driven sand particles.

The corrosive conditions in this location were so bad that adequate maintenance was considered almost impossible. However, some three years ago a paint contractor thoroughly cleaned this structure and equipment by means of sand-blasting and flame cleaning and applied two coats of an Anti-Corrosive Paint. The paint materials used were manufactured by Subox Inc., Hackensack, New Jersey.

Case 51-Texas

#### of equipment in this section of the country.

Now when the base for a 1,100-ton press breaks, you don't just go to the stockroom and draw out a replacement. You have your choice of ordering a new base from a foundry or fabricating a base in your own shop, and doing it fast. Otherwise the prospect of lost production begins to exert a squeeze comparable to the force of the idle press.

Through their experience with the use of Unionmelt welding in the fabrication of boilers, heat transfer, oil refining and similar equipment, management at Henry Vogt Machine Company decided to expedite the repair of the press using this process to fabricate a base in their own shop. Such a step, they felt sure, would enable them to get the press back into operation long before a replacement could be obtained. This was done and the press was back in

#### ase of-lexas

#### Thrust Bearing

Problem: Exposed to water while in operation. Not possible to keep lubricated. Corrosion of metal bearings decreased efficiency, and shortened the life of the bearing.

Solution: Adoption of Phenolformaldehyde plastic with graphite filler, eliminated loss due to corrosion, and utilized the ever present water as lubricant, in addition to self lubricating graphite in bearing material.

#### Packing Ring

Problem: Cheap metal rings corroded in alkaline solution. Corrosion resistant rings had to be broken in many instances, because of alkaline deposits around them, to remove them from stuffing box when replacing packing. Cost of replacement and time loss in changing was excessive.

Solution: Molded thermosetting plastic rings brought replacement parts to reasonable cost, and simplified removal of old rings, reducing labor and machine down time.

#### Floor Covering

Problem: After trying out various types of floor coverings, including an expensive square foot special brick, rubber floor was tested to determine whether or not this would resist the action of the various acids used in the laboratory.

Solution: Wright Rubber Tile was used because it did resist all action of chemicals, acids and abrasive wear, and was laid over the entire laboratory floor.

-Courtesy Wright Mfg. Co., Houston, Tex.

#### Section 6

### **POWER TRANSMISSION**

#### Case Studies

V-belt installation . . lubrication at 400 F . . drive maintenance . . conveyor speed reducers . . monorail lubrication . . slip-on guards . . rubber bearing . . savings by group drives

#### Case 52-Oklahoma Textile Mill

#### V-Belts Save \$100 per Week

A T the Commander Mills, Inc., Sand Springs, Oklahoma, the cards are driven in groups of eighteen from overhead lineshafts.

#### Problem.

Formerly, parts of the drive became worn and caused vibrations which pounded out the motor bearings. At least one drive had to be shut down for motor repairs each month. It was necessary to keep constant check on the level of lubricant for the drives formerly used. Maintenance and down time costs exceeded \$100 per week, and the management decided to install a drive which could be operated more economically.

#### Solution.

Resilient V-belts were installed by a Gates engineer to absorb vibration and shock, thereby protecting the motor bearings. The money formerly spent for lubricants and maintenance was saved as a direct result of installing the V-belts

Although the change-over was

made three years ago and the drives have operated on a 24-hour schedule since that time, the only maintenance has been an occasional tightening of the belts. The savings have amounted to approximately \$100 per week.

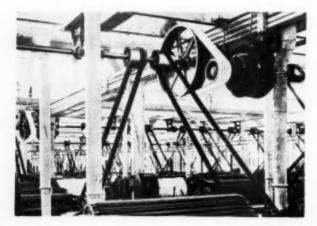
#### Case 53—Georgia

#### Lubrication at 400 F

SPLENDID results are being secured by the use of Lubriplate on roller bearings of kiln cars in a Georgia brick and tile plant.

#### Tests Made

Following an initial test, Lubriplate No. 630-AA, manufactured by Fiske Brothers Refining Co., is presently being used on 180 kiln cars each having four wheels equipped with roller bearings. Before the cars enter the kilns, each car is loaded with unburned brick having a total weight of six tons. The cars move through the kilns at a slow but continuous speed and are propelled by a Dennison Engineering Co. Hydraulic Pusher. The pressure required to push cars through kilns is recorded on a graphic chart. The cars are in the kilns about 52 hours and subjected to maximum temperatures in excess of 2000 F. However, the wheels are insulated from the upper part



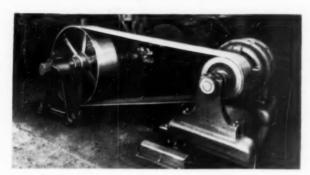
of the car and temperature of the wheel bearings seldom exceeds 400 F.

With the lubricants previously used, it was common practice for the wheels to seize to axles due to carbonizing. This required the kiln to be shut down for periods of time causing much loss in production.

This has been entirely eliminated since changing to the present lubricant. Also it now takes considerable less power to push the cars through the kilns. The amount of No. 630-AA required for lubrication of the wheel bearings is a small fraction as compared to lubricants formerly used.

Case 54-Maryland Brick Plant

#### Maintenance of Drive Cut



IN an effort to eliminate high maintenance costs, the Champion Brick Company of Baltimore, Md., replaced a drive on a Chambers brick machine with a UNI-PULL installation. A recent check-up reveals that, with this modern self-controlling leather belt drive, it has achieved its purpose and made a power saving as well.

The machine is driven by a 125 hp 880 rpm motor at 98" shaft centers. The drive, formerly used, required frequent repairs and replacement of parts. Vibration made the motor bearings heat up and endangered the motor.

The new drive consists of a Rockwood pivoted motor base, to provide tension control, and an 18" double leather belt. The installation employs a 19" diameter fibre motor pulley and a 54" diameter cast iron driven pulley. The 98" shaft center distance was not changed.

- The cost of drive maintenance has been greatly reduced.
- The drive now requires less electric power.
- The temperature of motor bearings is reduced.
- Smoother operation has been obtained with practically no vibration.
- Full production has been maintained.
- -Courtesy American Leather Belting Association.

Case 55-South Carolina Quarry

#### **Handling Improved in Rock Quarry**

IN a prominent rock quarry in South Carolina, the primary crusher was located about 1200 ft from the base of the hillside quarry. The material had to be carried by truck up a 9 degree grade where each had to be tipped on a swivel body for discharge. It was

desired to eliminate the long haul and down time due to any breakdowns of the moving equipment. The primary crusher was moved to the base of the mountain and located about 40 ft below the surface.

Discharge from the crusher is to

a 42-in. belt conveyor, having approximately 250 ft centers, which runs to the screen house. A 36-in. conveyor on about 525 ft centers carries the fines and various sizes of aggregate. Both conveyors required about 100 horsepower so they could be standardized with the same size Jones Single Type Herringbone Gear Speed Reducers with individual ratios to suit the 125 hp 580 rpm and 860 rpm motors that were used. Each reducer was installed with a Won-Way Backstop.

Since the fall of 1947 these units have been operating at least ten hours each day and moving thousands of tons of rock. There has been practically no maintenance. The long truck haul has been reduced and with the conveyors has made for more economical over-all handling of the rock.

Case 56-Drying Oven

#### Lubrication Problem Solved

In a large plant with a 700-ft monorail conveyor system, the problem of lasting lubrication through degreasing and drying oven operations defied ordinary petroleum products.

Cans being carried on the rail move through the following sequence of events: degreasing, washing, drying, prime paint coat, drying, final paint coat, final drying. With conventional lubrication the conveyor moved jerkily, due to gum-up of the lubricant at high temperature and dissolution at degreasing. Breakage and downtime were high.

A switch was made to a colloidal graphite suspension in paint thinner. This microscopically fine solid lubricant is chemically inert and hence impervious to the action of degreaser solvent. It is also unaffected by heat up to 5000 F in inert atmospheres. Sprayed on the conveyor one day a week (for 1½ hours) through two guns mounted six inches from the edge of the chain, it provided perfect freedom of motion for the system.

Courtesy Acheson Colloids Corp.



Case 57-Alabama

#### Slip-On Guards Aid Inspection

AINTENANCE of guarded Vbelt drives at an Alabama
textile mill is made easier by using
Slip-On guard mounts. Previously
guards were bolted onto the machines; inspection of V-belts required three to four minutes. The
new Slip-On mounts require only
a few seconds to inspect the drive
and the cost of the mounts is only
a few cents per drive.

By Albert Weigle

Case 58-Texas

#### Rubber Bearing Simplifies Pumping Unit

A new rubber bearing which radically simplifies the design of oil well pumping units has been developed jointly by United States Rubber Company and Cabot Shops, Inc., at Pampa, Texas.

The new bearing, which is used in the evener assembly, reduces from 100 to 38 the number of parts required for pumping unit construction.

Field tests in West Texas, Panhandle, and Louisiana oil fields, have shown that the rubber bearing wears at least twice as long as the standard type installation.

In addition to the economies made in the simplification of

pumping unit design and longer wear, rubber was selected for bearing construction for the following reasons:

- Rubber eliminates lubrication since the assembly needs no frictionally sliding or roller parts.
- It is resistant to salt water, sand, grease, and grit.
- It insulates the gear box from excessive well shocks caused

by fluid pounds, gas lock, sanding up or paraffin.

- It eliminates the need for elaborate assembly to provide for misalignment because of its self-aligning properties.
- Since rubber flows and flexes within itself, there is no initial friction to overcome and almost no wear as long as flexing is held within rubber's known fatigue limits.

#### Case 59-Southwestern Woodworking Plants

#### Savings by Group Drives

THERE are certain types of industries where Diesels, turbines, steam engines or large motors with group drives are a more economical means of supplying power to a group of machines than would be possible with individual motors.

Where such conditions exist, large flat belt drives are often an important part of equipment. Plant managers often recognize the importance of such a layout under their particular conditions and know that a change over to what may seem to others a more modern layout would prove not only expensive in first cost but too expensive to operate year after year. Where layouts based upon a steam engine or large motor are used. it is clearly important that the belt drives from the source of power to the line-shaft and to the individual machines must be good. Shaft losses must be minimized through the use of suitable bearings, correct layout, and pulleys and belting of suitable type. Particularly with belting it has been found that the best types will last longer and reduce maintenance costs and losses through slippage at peak loads.

#### Case Histories

Two such examples have been observed recently. One is in a large woodworking mill in the Southwest which uses on its main drive a 40-in. three-ply leather belt over 100 ft long, driving from a 14 ft diameter flywheel on the engine to a 48-in. driven pulley at a belt speed of 5280 fpm. This carries about 1,000 hp. The best quality of belt ran three times as long as

ordinary leather belts and gave nearly 5 per cent higher machine speeds than was possible to obtain with the ordinary belts having a lower coefficient of friction. Fabric belting tried on the same job would carry only ¾ of the load obtained with the high grade leather belt. Experience and careful observation convinced management that the best is the cheapest. Aside from the increased production, the expensive belt cost less than ½ as much a year as much cheaper belts did.

At the other mill, also in the Southwest, the main steam engine supplied power to a flour mill consuming about 950 hp and sometimes considerably more. The main engine drives through a line-shaft directly into one department utilizing a 42-in, belt and through another large belt driving another department and also a generator. For years, cheap leather belting had been purchased and while the life was not too short, it was impossible to get all of the power desired from the engine and to the machines and generator. These three belts were replaced with high capacity special tannage belts and the mill output immediately increased and the generator was able to take care of the desired electric load which it could not before. It was estimated that the added load transmitted satisfactorily was in the order of 150 hp. Gains in production should go a long way towards paying for the cost in a short

These are but two examples of cases where cooperation between management and supplier has paid big dividends. Section 7

# PIPING AND ACCESSORIES

Case Studies

Rubber lined equipment . . steam traps . . submersible pumps . . underground conduit system . . renewable disc valves for boiler . . stopping compressed air leaks

Case 60-Kentucky

#### Rubber Lined Vessels and Pipe

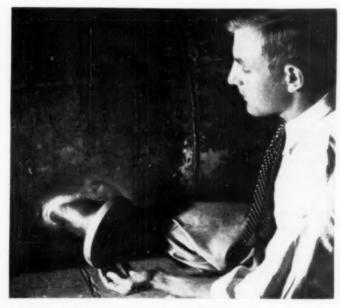
POR a long time acid resistant rubber compounds have been advantageously used in industry. But never have they been more popular than now, thanks largely to improved synthetic materials, many of them remarkably immune to attack by corrodents.

Today, rubber is being employed on a large scale in lining vessels, piping and other components involved in the processing and storage of corrosive products. The equipment is not only highly serviceable, but relatively low in cost.

The Acme-Fisher Division of the Broadway Rubber Company, Louisville, Ky., carries on tank and pipe lining operations that are attracting considerable attention. With a backlog of 48 years of experience in the rubber field, the firm has been successful in the solution of a long list of lining and coating problems dealing with the handling of acids, alkalis, aromatic solvents, unsaturated vegetable oils, gases, vapors, and the like. Of particular interest, is that Tube-Turn welding fittings up to 90 degrees, and Tube-Turn flanges, manufactured by Tube

HERE IS THE APPLICATION OF A 3-IN. TUBE-TURN SLIP-ON FLANGE. IT IS WELDED TO A NIPPLE ON A TANK BUILT FOR A MAJOR SOAP COMPANY. THE VESSEL'S RUBBER COMPANY. THE VESSEL'S RUBBER LINING IS EXTENDED THROUGH THE NIPPLE AND ACROSS THE RAISED FACE OF THE FLANGE. JOINED WITH A FLANGE AND PIPING SIMILARLY PRE-PARED, THE MATERIAL (CHLOROSUL-PHURIC AND HYDROCHLORIC ACIDS) CANNOT COME INTO CONTACT WITH THE METAL. THE TANK IS 7 FT LONG AND 30 IN. IN DIAMETER, AND OF CARBON STEEL CONSTRUCTION. THE LINED PORTIONS WERE FIRST COV-ERED WITH BONDING CEMENT, THEN A-IN. SHEET RUBBER, AND FINALLY WITH RUBBER CEMENT, THE VUL-CANIZING OPERATION WAS ACCOM-PLISHED IN THREE HOURS IN AN AUTOCLAVE, WHERE THE TEMPERATURE WAS HELD AT 230 F AND THE PRESSURE WAS 50 PSI.

Turns, Inc., Louisville, Ky., contribute to the structural strength and long life of vessels and piping lined by Acme-Fisher.

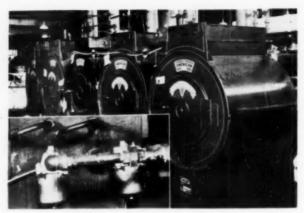


SOUTHERN POWER & INDUSTRY for OCTOBER, 1950

#### Steam Traps Increase Production 35 Per Cent

N example of how steam traps increase the efficiency of steam using equipment is this case history of the Sanitary Laundry Company, Baltimore, Maryland,

This company operates four 36in. x 30-in. and one 30-in. x 18-in. double coil type air tumblers for drying purposes. The five tumblers were originally inadequately drained by only one steam trap which was not removing all the condensate and air from the five tumblers, thereby, greatly decreasing their heat output. To correct this situation, this company installed a steam trap on each coil of every air tumbler (two traps per tumbler). The Super-Silvertop in-



V. D. Anderson steam trap installation at the Sanitary Laundry COMPANY, BALTIMORE, MD.

verted bucket type steam traps were supplied by the V. D. Anderson Company. The discharge from each group of two traps was tied together and lifted to a return main 14 ft above the traps.

The trapping resulted in a much higher tumbler temperature as the proper trapping of each coil kept the equipment drained dry and free of entrained air. The company reported that the higher tumbler temperature resulted in a shortened drying period which in turn increased drying production from 30 to 35 per cent. A reduction of fuel and steam costs was also achieved

Case 62-Texas Utility

#### Submersible Pumps

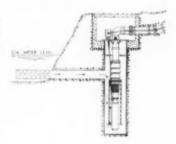
PUMPING water from the Rio Grande River is made easier at the Central Power & Light Company, Laredo, Texas, power station by using two Byron Jackson river intake submersible motor-pumps, consisting of a close-coupled D. W. T. type pump bowl assembly and an oil-filled motor that is sealed for underwater operation.

Each pumping unit is designed to

deliver 1000 gpm of river water against 116 ft total dynamic head. This is accomplished by a 3-stage

THIS SCHEMATIC DIAGRAM SHOWS BASIC ARRANGEMENT OF THE PUMP-ING UNITS. OPERATION OF PUMP IS INDEPENDENT OF RIVER WATER LEVEL. SUCTION AND DISCHARGE PIPING AR-RANGEMENT IS SIMPLIFIED AND REL-ATIVELY INEXPENSIVE, THERE IS NO NEED FOR A PUMP HOUSE. THE UNITS ARE EASY TO INSTALL

D. W. T. type bowl assembly closecoupled to a 40 hp, 6 pole, 440 volt, 3 phase, 60 cycle, Byron Jackson submersible motor.



Case 63-Texas University

#### Underground Conduit System Solves Difficult Problems

THE conduit designer is faced with a twofold problem. First with a twofold problem. First, an interior metal pipe line conveying a certain liquid or vapor must have a protective coating or thermal insulation; and second, this assembly must be housed in an exterior casing which will support casings must have sufficient

By Wm. J. Whatley

Whatley Steam Systems Houston, Texas

the interior member and maintain it in its best condition. In addition, it must resist corrosion, and the strength to withstand repeated wheel loads on the surface. And, if possible it must provide ventilation and drainage for the entire system.

Water-Tight Underground Conduit. Houston, Texas, has developed a system which meets these

# WeldELLS

Let's get down to fundamentals,'— There is only one permanent way to join pipe—only one joint as strong as the pipe itself—the properly welded joint.

A properly welded joint involves just two basic factors — a good fitting and good welding. In the WeldELL line you have not only the fitting that expresses the highest development in engineered strength and closely controlled metallurgy . . . you also have the fitting with features that enables the welder to do his job better and faster.

The WeldELL line embraces the widest range of sizes, weights, types and materials. In many sizes and types there are no fittings BUT WeldELLS!

# TAYLOR FORGE

TAYLOR SPIRAL PIPE is available in a broad range of sizes and thicknesses. Coupon brings Spiral Pipe Bulletin 493.

TF

TAYLOR FORGE & PIPE WORKS

P. O. Box 485, Chicago 90, Illinois Offices in all principal cities: Eastern Plant: Carnegle, Pa. Western Plant: Fantana, Calif.

758-1050

requirements, and has proven its value in actual service in the Southwest.

#### Design

The outer casing is a pressure pipe of compressed cement-asbestos construction, and rubber rings are used as coupling seals to withstand an internal pressure of 500 psi. Spacing between the inner conducting pipe and the outer casing is maintained by use of a refractory support of a correct outside diameter to fit the outer casing. and the correct inside diameter to carry the transmission pipe and installation. An embedded steel plate in the refractory support permits welding the support to the inner pipe, fixing it in position where it is always in place and will not disrupt pipe insulation by expansion. At each quadrant of the refractory support, semi-circular openings are provided. The three upper openings serve to ventilate the system, and the bottom opening serves as a drain.

#### Application

This conduit system has been in constant service for steam and condensate return lines for over six years for very bad soil conditions in the Gulf coastal areas. Recently it has been installed to serve distilled water, steam, and condensate return lines at the University of Texas, Medical Branch, Galveston, Texas. Present designs of a Southwestern municipal airport have included seven types of services, all of which will be served by this system.

Most coastal areas have a corrosive atmosphere as well as bad ground conditions, all of which require special treatment of the interior pipe when it is uninsulated.



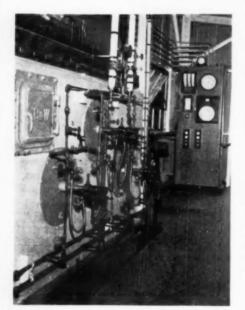
THIS VIEW OF THE REFRACTORY SUP-PORT SHOWS THE SEMICIRCULAR VENTILATION AND DRAINAGE OPEN-INGS AND THE EMBEDDED METAL PLATE THAT IS WELDED TO THE IN-NER PIPE.

All conditions of this kind have been successfully met. Expansion and contraction are easily handled by using the loop system, slipjoints, or sections of prefabricated corrugated pipe.

#### Case 64-Florida Food Processing

#### Renewable Disc Valves Save for Citrus Plant

THE Minute Maid Corporation, producers of concentrated frozen fruit juices, conducted ex-



tensive research at their engineering department in Plymouth, Florida, to determine the type of valve best suited for their intricate boiler and processing equipment. They found that valves with nonmetallic renewable discs not only had the throttling ability required, but reduced their replacement costs substantially.

Instead of stocking a large inventory of complete valves, they were able to handle their valve maintenance with an inexpensive supply of the renewable discs and seats.

When the firm's new plant was constructed at Leesburg, Florida, The Lunkenheimer Co., originator of the renewo type of valve, was awarded the valve contract. A close check was kept on production costs.

W. H. Harte, Minute Maid Process Engineer, said in reporting results: "Over-all production costs have been reduced by the small maintenance inventory required. The non-metallic renewable discs are a relatively inexpensive item to stock to insure the proper operation of the valves."

"In the year and a half that we have standardized on the valves," said Harte, "we have had no particular maintenance problems." Repairs to the renewable-disc valves have been made with minimum loss of production time.

LUNKENHEIMER VALVES INSTALLED ON BOILERS AT MINUTE MAID CORPORATION'S LEESBURG, FLORIDA PLANT.



#### Case 65-Maryland

#### "Blast" Traps

SLOW heat-up time of drying ovens, with consequent retarding of production, was a problem at the Emerson Drug Co., Manufacturers of Bromo-Seltzer at Baltimore, Md.

Air in the oven coils was held to be primarily responsible. Air, in such cases, acts as an insulator, thereby reducing heat transfer rates. Another factor considered was the probability that the steam traps were not discharging condensate as fast as it accumulated.

The installation of Armstrong



"Blast" Traps proved a satisfactory solution. Since the blast traps have extra air venting capacity, air and condensate are blasted through to the discharge line when steam is first turned on. Heat-up time has been reduced 40 minutes, increasing the speed of the drying cycle and boosting production accordingly.

#### Case 66-Tennessee Metalworking

#### **Fabricator Stops Compressed Air Leaks**

A FABRICATOR of steel products in eastern Tennessee found production costs excessively high. A survey of his plant indicated that excessive air leaks and improper pipe sizes resulted in air pressure at the tools being only 20 to 30 pounds. By redesigning the pipe layout, he reduced the pres-

sure drop and by installing air valves made by the Cleco Division of Reed Roller Bit Company, Houston, Texas, he eliminated air leaks and increased working pressure at the tools to 90 pounds gauge, Production was stepped up approximately 400 per cent and his production costs were reduced \$90.00

per day. The total investment for piping, valves, and couplings was paid out in 25 working days.

Loss of pressure through undersized air lines and air leaks are extremely expensive. A leak equivalent to a hole ½-in. in diameter will result in a loss of about \$44.00 per month in compressed air.

#### Case 67-Georgia

# Steam Per Hour

PROPER application of correctly designed steam traps may accomplish annual savings that more than equal the original cost of installing these devices. The following example illustrates how a manufacturer of paper cups in the state of Georgia made outstanding savings in fuel by the proper retrapping of their wax applicator machines.

In this plant approximately 30 old-style steam traps were used to remove condensate and entrained air from wax applicator machines. Because of obsolescence and improper design, these traps were operating inefficiently, failing to

drain condensation and vent the air. The traps were replaced by Super-Silvertop inverted bucket steam traps (made by the V. D. Anderson Company) which adequately trapped the wax applicators.

The net saving in steam consumption was approximately 4000 lb of steam per hr, which was reflected in lower fuel costs. Owners now plan to decrease the burner capacity on the boilers. On this basis these modern, efficient steam traps paid for themselves in less than one month.

#### SPECIAL BETTER PRODUCTION READER SERVICE

An important SP&I reader service for this BETTER PRODUCTION issue is described on page 65.

For more detail regarding these case histories-

equipment or evaluation of results—simply circle the number on the reader service coupon and mail to us.

We will request the equipment manufacturers to send the desired information direct to you.



Yarway Impulse Steam Traps get equipment hot and into production faster. Extra profits!

Then they keep it continuously at peak operating temperatures for maximum production. More extra profits!

What's the reason for hotter, sooner? Just this. When steam is turned on, Yarways open wide, discharging the air and condensate in a burry -closing only when steam arrives. Then, when operating temperature has been quickly reached, the little valve (only moving part) literally floats on the load . . . discharging heatretarding condensate as soon as it forms instead of waiting for quantities to accumulate. Thus equipment is held at peak operating efficiency.

Other economical features of Yarway trapsminimum maintenance, easy installation, low

More than 600,000 Yarways have already been installed. Sold by distributors throughout the world.

Try a Yarway today ... standardize on Yarways tomorrow.

#### YARNALL-WARING COMPANY

Home Office: 116 Mermaid Ave., Philadelphia 18, Pa. Southern Representative: ROGER A. MARTIN

Bone Allen Building, Atlanta & St. imless Stell Body

Nest of Yarway traps installed with Yarway Strainers on cloth dryer. Note small space required.



#### Section 8

# PRODUCTION EQUIPMENT

#### Case Studies

Power tools . . heat treat ovens . . machine tools . . metal cleaning methods . . infra red drying . . layout . . cards and cameras for accounting . . diamond coping wheels . . engineering services

Case 68-Tennessee Chemical

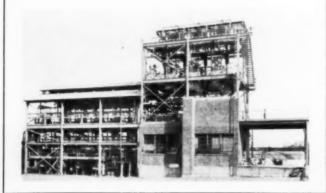
#### Outdoor Plant Improves Working Conditions

THE Research and Engineering Divisions of the Tennessee Products and Chemical Corporation have in recent months designed, erected and put into operation a novel and highly efficient "outdoor" plant for the manufacture of insecticides.

The illustration shows equipment arrangement and supports and indicates the "out-of-doors" set-up. The brick, completely enclosed section is where the finished crystalline product comes out and is packaged.

Highly inflammable and explosive raw materials, coupled with the use of toxic gases, suggested the desirability of building a plant where natural, fresh air ventilation could aid in promptly dissipating unavoidable or unexpected leakages.

In addition to the "fresh air" structure, every device is included to minimize explosion, fire and health hazards, and it is significant that operators and laborers prefer to work in this new plant.



Case 69-Texas

#### Power Tools Save Labor

THE International Motor Rebuilding Co., of Houston, Tex., uses four Ingersoll-Rand electric impact tools to tear down and assemble automobile engines. The power tools enable them to do a 3-hour job in 1 hour and 5 minutes, with a 64 per cent saving in labor time.

The shift from hand operations to the Impactool raised shop production better than three engines a day with the income per engine \$100, the cost of new parts an average of \$23.00, and all other costs unaffected. An increase in production of three units a day brings in an additional \$231.00 of clear net profit. Figured conservatively, this comes to more than \$50,000 profit a year.

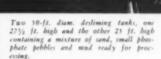
Case 70-Texas

#### Liners Treated in Box Type Oven

A BOX type heat treating oven, designed by The Lanly Company, Cleveland, Ohio, was recently installed in the plant of the Mission Manufacturing Company,

## 14 Horton Tanks Used in Florida Mining Operation







Ten 22-ft. Itam, by 18-ft, phosphate tanks. Coarse material is stored in the four shown at the left and concentrates are stored in the six tanks to the right.

Recently, the American Cyanamid Company opened its second phosphate rock mine east of Tampa. This open-cut operation, known as the "Sidney" mine, helps supply hundreds of thousands of tons of phosphate rock products annually to agricultural and industrial users all over the world. Included in the processing equipment at this new Florida mine are 14 Horton® welded steel tanks.

These large, specially designed tanks are used both in the desliming process and for storage purposes. Four 50-ft. diam. processing tanks deslime a fine slurry of sand, phosphate pebbles and mud, and hold it for transfer to the flotation plant. Ten 22-ft. diam. hopper-bottom tanks are used to store both coarse phosphate pebbles and fine concentrate, preparatory to shipping. These tanks are elevated 14 feet above the ground to enable freight cars to pass underneath and thus facilitate easier loading.

Specialized tank construction such as found here offers no obstacles to our design, fabrication and erection departments. Their knowledge enables them to tackle any problem with complete confidence. If you have a tank problem, consult our nearest office.

Trade name for tanks built by . . .



10-ft. diam. by 13-ft. welded steel processing and feed storage tank. It is one of four such units used to deslime fine surry and store it until it's fed into the flotation plant.

#### CHICAGO BRIDGE & IRON COMPANY

Atlante 3. 2180 Heatey Bidg. Berrolf 25. Birminghem 1. 5531 North Fifther 51. Houston 2. 2132 N Houston 2. 2132 N Houston 2. 2132 N Houston 2. 2132 N Houston 3. 2107 McCommick Bidg. Los Angeles 17. 1545 G Clavelaced 15. 2218 Gelidhall Bidg. New York 6. 3312 Plante in BiRMINGHAM. CHICAGO, SALT LAKE CITY, and GREENVILLE.

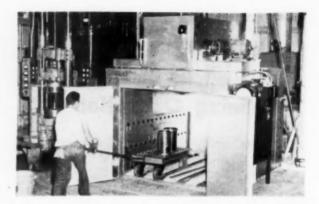
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Houston, Texas. Slush pump liners are heat treated in this oven following induction hardening.

The oven has a capacity of 24 liners with an average weight of 200 lb. The liners are loaded on racks mounted on heavy duty casters to facilitate moving the liners in and out of the oven. The oven body consists of panels having metal outside sheets encasing fiberglass insulating blankets.

Even temperature is maintained throughout the oven by means of heated air distributed by duct work. The air is heated by a built in recirculating type gas-fired heating system with a capacity of 500,000 Btu per hour to maintain the desired operating temperature.

The oven temperature is controlled by a Partlow Recording Temperature Controller equipped



with a super sensitive temperature sensing element and switch assembly. This provides for a minimum temperature fluctuation in the oven which is so desired in this process. Automatic temperature and safety controls as recommended by the National Board of Fire Underwriters assures safe and satisfactory operation of the oven.

#### Case 71-Southwestern Metalworking

#### **Better Use of Machine Tools Cuts Costs**

A SOUTHWESTERN lamp and stove manufacturer makes full use of the adaptability and

flexibility of modern machine tools in both the standard units and also in special setups and special purpose machines. A few of the Delta tools used in this company's operations are illustrated.

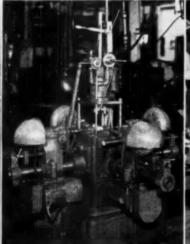
Continuous studies of procedures and application of modern equipment help this lamp and stove company increase its production and cut costs.

THIS 14-IN, DRILL PRESS MOUNTED HORIZONTALLY, IS FITTED WITH AN AIR-OPERATED, SELF-OPENING BAG CHUCK FOR SPREADING SMALL DIAMETER RUNUPS AND WIEES. THE OPERATOR FINISHES 800 PIECES PERHOUR, DRILL PRESS MAY BE RETURNED TO ITS REGULAR VERTICAL POSITION FOR DRILLING AND CAPPING.

THIS IS A SPECIAL PURPOSE MACHINE MADE UP OF FOUR 14-IN.
DRILL PRESS HEADS FOR DRILLING HOLES IN A BURNER MANIFOLD.
PRODUCTION IS 250 PIECES PER HOUR. UNIT IS BOTH HERMETICALLY AND HYDRAULICALLY OPERATED, BEING ALMOST COMPLETELY AUTO-MATIC.

THESE THREE 17-IN. DELTA DRILL PRESS HEADS MOUNTED ON THE BASE OF AN OLD WORN-OUT MACHINE V/HOSE ORIGINAL HEADS WERE NOTHING BUT JUNK. THIS MODERNIZATION OF OLD MACHINERY IS IMPORTANT TODAY. USE OF THE DELTA HEADS HAS SALVAGED THIS UNIT AND MADE A GOOD MACHINE OUT OF IT.







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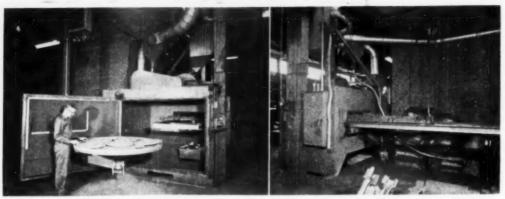


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## INDUSTRIAL TRUCK DIVISION - CLARK EQUIPMENT COMPANY - RATTLE CREEK 13 MICH Please send the items checked 🗆 Movie Digest 🗀 Products Catalog 🗀 Material Handling News

NAME FIRM NAME STREET THORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS



WHEELABRATOR INSTALLATION AT THE NEWMAN MACHINE Co., INC., GUILFORD FOUNDRY CO., DIV., GREENS-BORO. NORTH CAROLINA.

#### Case 72-North Carolina

#### **40 Per Cent Faster Cleaning**

JEWMAN Machine Co., Inc., Guilford Foundry Co., Div., Greensboro, North Carolina, builder of wood working equipment have a variety of castings to clean.

Some of these castings are small. and others-machine bed castings for example-measure up to 16

ft in length by 40-in. in width. To handle all of these castings, they purchased a Wheelabrator 66" Swing Table. This airless abrasive blast cleaning machine is manufactured by American Wheelabrator and Equipment Corp., Mishawaka, Indiana.

The smaller castings are handled on the Swing Table in the conventional manner, but the larger castings required a slight modification of the standard machine. As installed, the Swing Table is equipped with a simple travelling platform on which long flat work is conveyed through the abrasive blast zone. Vestibules cut through the back wall and a swinging door permit the entry of the castings into the machine for fast, thorough cleaning. When no long pieces are to be handled, the machine operates as a standard Swing Table

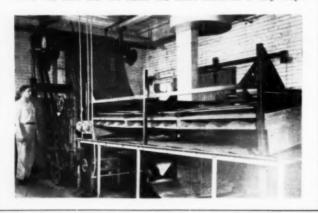
The installation of this one machine reduced cleaning costs 40 per cent. In addition, machining costs were slashed through faster processing and lengthened tool

#### Case 73-Georgia

#### Infra Red Drying for Seat Covers

THE problem at Swift Manufacturing Company, Columbus, Georgia, was, after the comparatively easy spraying of lacquer on the seat cover material, to quick dry it without damaging or changing the characteristics of the basic material.

One G. E. infra red oven was the solution. As you can see by the length of the oven, the drying process was quick and the infra red heat did not harm the basic material in any way.



Case 74—Tennessee

#### **Efficient Cleaning** of Quench Oil and Coolant

O IL quenching, grinding, and finishing steel parts are important operations in Mechanics Universal Joint Division (Borg-Warner Corp.), Memphis, Tenn. Important production equipment in the plant includes: 3 American gas furnace heat treating machines, 4 Cincinnati grinders, and 5 Blakeslee washers. In this plant



Honan-Crane Corporation oil cleaning equipment solves four separate problems.

#### Problem 1

Metallurgical control during the heat-treating process is much more precise if the quench oil is maintained in uncontaminated condition and free from moisture. Recognizing this, Mechanics Memphis plant installed oil purifiers in a central purification system before the plant was put into operation.

The central system consists of two Honan-Crane multiple cartridge type purifiers piped to a 10,000 gallon supply tank. Each purifier is equipped with a 10 gpm pump and motor unit. Piping and valve arrangement permits both purifiers to operate in series or parallel or one unit at a time.

This continuous recirculation maintains the quench oil in a clean condition and eliminates the necessity for cleaning the system periodically. Removal of contamination, as it forms, keeps the oil in condition approximating new oil.

Economy of operation, due to this system, is readily apparent. Noteworthy savings have been effected and uniformity of product is never jeopardized by use of contaminated oil.

#### Problem 2

When the quench oil system was put into operation in May, 1948, some means was required to collect the oil which dripped from the quench tank conveyors as the parts were delivered from the tank.

A drip tub for each quench tank was installed under the floor grating. The tubs hold 40 gallons each and require emptying and cleaning twice a week. The time of three men for one hour was required to empty and clean the tubs. The oil was dirty and therefore discarded.

To solve this cleaning and disposal problem a Houdaille mobile coolant filter was purchased. Twice a week this mobile filter is placed directly above the drip tub. By removing a section of the floor grating, suction hose on the filter is placed in the tub located approximately six feet beneath the floor. The dirty oil is drawn by the



Case 75-Alabama

#### **Efficient Layout**

FFICIENT layout of production equipment and associated controls is one of the main features of the new plant of the Coosa River Newsprint Company. This view shows five of the nine Bleach Plant Washers. Plenty of aisle space, ample room between machines, and streamlined benchboard controls immediately adjacent to the drive equipment make it easy to keep this plant in A-1 operating condition with a minimum of effort.

Each washer is driven by a Reliance Electric and Engineering Co. V\*S unit. The 15 hp, enclosed, force ventilated, dc motors may be seen in this view. The packaged power units for each motor are mounted in another room. At the end of the room may be seen a control panel of recording instruments. On each side of the panel is a 2 hp Reliance V\*S drive, which delivers the pulp to this level of the plant.

filter pump through the filter and filtered oil is returned to the quench tank. The filter bag removes the solid contamination, delivering clean oil to the tank.

With this mobile unit, one man cleans three tubs in 45 minutes.

#### Problem 3

One phase of production at Mechanics Memphis plant employs a battery of eight machines which perform multiple operations. To maintain efficient operation and to safeguard the quality of the product, the coolant oils used in these machines must be kept free from contamination.

Eight Houdaille clarifiers are individually mounted to remove contamination from the oil coolant. No accumulation is built up in the sumps and the finishing process is not hampered by foreign particles in the coolant.

The clarifiers have made noteworthy savings by lengthening the

filter pump through the filter and useful life of the oil and reducing filtered oil is returned to the maintenance costs.

#### Problem 4

Cleaning sumps and drip pans for four grinders and five washers is accomplished by one 125 gallon Houdaille sump cleaner.

A three-way valve on the sump cleaner permits it to be used either for suction to remove dirty coolant from sumps or for pressure to dispense clean coolant to sumps after cleaning.

With this unit one man removes the soluble oil coolant and all of the accumulated grindings in the sumps of the grinders at the rate of five minutes for each sump.

The sump cleaner is used also to remove and transport for disposal washing solution from splash pans which collect drainage from steel tubing as it passes through the Blakeslee washers. One man handles cleaning and disposal for all five washers.

# INEY-SAVING NEWS FOR DIRECT CURRENT USE'S 1-T-Es New, Proved Mechanical Rectifier Curs Power Conversion Costs!

Why? Because this amazing, dependable rectifier has a conversion efficiency of 96% or better! It requires no special foundations or housings, saves you money in building and installation costs.

It requires little space, is instantly available for service because it needs no warm-up period. Maintenance and repairs are cut to an absolute minimum.

The I-T-E Mechanical Rectifier has proved itself in industry, with day in, day out — year in, year out efficient service. If you need efficient, dependable, low voltage power conversion, it will pay you to get the facts on

#### **I-T-E Mechanical Rectifiers**

For applications up to 10,000 amperes per unit in the 50 to 400 volt range.

For full information write for Bulletin 4809 or see your nearest I-T-E representative.



#### PROVED IN OPERATION

At the Buffalo Electro-Chemical Company, Inc., Buffalo, N. Y., two I-T-E Mechanical Rectifier units, both rated at 3500 amperes, 260 volts d-c, and in operation more than a year-and-a-half, have given 96.6% efficiency!



MECHANICA

RECTIFIER

1-7-6 Circuit Breaker Company, 19th and Hamilton Streets, Philadelphia 30. Fr

New Bolting Spigmant: Author and parents Engineering Dr., Southern Pa.

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## Quality control

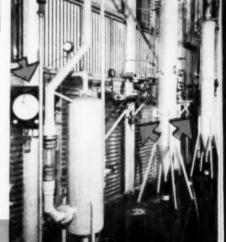
in JUICE INDUSTRIES (Div. of Clinton Foods, Inc.) Modern Plant at Dunedin, Florida

Increases soaring demand for their products



. . . controlling the SKINNER Mallorizer (above) and De-Oiler (at right) play their part in helping to maintain the uniformly fine flavor for which JUICE INDUSTRIES products are famous.

Whenever the quality of your products and your *profits* are are affected by accurate, uniform temperature regulation... consider POWERS. With almost 60 years experience and a wide variety of pneumatic and self-operated controls we may be able to help you select the best equipment for your requirements. If you have a problem of temperature or humidity control contact your nearest POWERS office or write—



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## POWERS REGULATOR CO.

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#### **Automatic Furnace Operation**

THE Southwest Fabricating and Welding Company of Houston, Texas, installed a car bottom furnace designed by the Surface Combustion Corporation, Toledo, Ohio, to stress relieve alloy pipe after fabrication. Fabricated pipe processed in this furnace is being used in refineries, chemical plants, and other processing plants not only in the United States but many foreign countries as well.

The furnace was designed for a maximum operating temperature of 2100 F. In order to restore the corrosion resisting properties of austenitic stainless steel after fabrication, the pipe sections must be heated to approximately 2100 F and water quenched to a black heat in a maximum of two minutes. A spray quenching system was designed by the Southwest Fabricating and Welding engineering department to quench the pipe on the

car as it is being removed from the furnace.

Accurate and even temperature is maintained throughout the furnace by the use of zone temperature controllers which in turn are operated by a master Time-Pattern Program Control System. The furnace is divided into 6 temperature zones so that variations in the mass of the load will not cause temperature variations within the furnace. In addition to the furnace temperature recorded on the circular charts for each zone, two six point strip chart recorders are also used to record the temperature in each zone.

#### Operation

Mr. E. J. O'Brien, Chief Engineer of Southwest Fabricating and Welding states that an outstanding feature of the furnace is automatic operation. After the furnace is charged and the pilot burners

lighted the cam type program controller takes over and operates the furnace without further attention by plant personnel. The time-temperature program desired is cut on a program cam. The cam is placed in the time pattern pneumatic transmitter which is connected to the six temperature controllers. The setting of the control point on each temperature controller is adjusted continuously and precisely as prescribed by the cam. After the charge has been heated and held at temperature for the prescribed period, the furnace temperature is reduced at a controlled

The furnace is heated with high pressure natural gas. The gas to the various zones is controlled by air operated valves. As a precaution against possible damage to the furnace should the gas pressure fall below a safe level, a self actuated safety valve is installed in the main gas supply line which will close and must be manually reopened when the gas pressure has been restored.

#### Case 77-Missouri Steel Mill

#### Cards and Cameras Keep Accounts Receivable Picture Clear

R EPLACING the traditional work tools of the bookkeeper and the credit manager with a camera and panels of visible index cards, the Marsh Steel Corporation.



North Kansas City, Mo., distributors of carbon and alloy steel and aluminum products, have pioneered an accounts receivable procedure. The results, according to the company's management, have been striking and far more favorable than had been anticipated.

They now have an ever-active record of customer payment performance and an always-clear picture of all monies due. And, they have it all with a minimum of clerical work, with unusual assurance of accuracy and at costs that are a fraction of those formerly involved in their invoicing and collection activities.

When executives of Marsh Steel decided they wanted a day-to-day picture of this important phase of finances, the accounting division took a literal view, and with the aid of Remington Rand systems and methods technicians, hit upon a camera and card panel combination that provided all the answers—and actual pictures, too.

To achieve the desired combina-

tion of active and static records, the Marsh procedure employs a handful of small panels, die-cut I.V.I. (index visible) cards and a Dexigraph (prism lens) photocopying camera. The accounts receivable situation at any given moment is presented by means of the constantly changing card and panel record. The camera serves to take off periodic "recaps," credit department records and posting data for the cash receipt and other ledgers.

Marsh executives feel that the principal value of the new procedure is the ease of handling and the constancy with which the accounts receivable picture is always available. Marsh management is satisfied that the camera belongs in the accounting department and is there to stay.

A longer more detailed article describing the procedures more thoroughly, and illustrating the equipment employed will appear in the November issue of SOUTHERN POWER AND INDUSTRY.

### HARNESS WASTE HORSEPOWER WITH

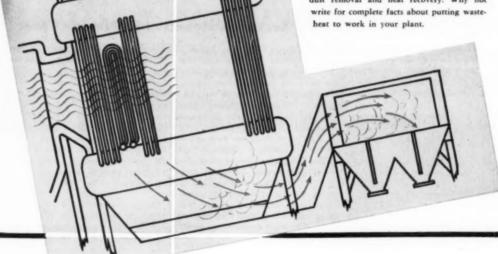
WE WELL

### WICKES WASTE-HEAT BOILERS

CONVERT WASTE-HEAT into PROFITABLE POWER Waste heat, once discharged from manufacturing equipment as a loss, has been made to realize a high economic return through the installation of Wickes Waste-Heat Boilers. In actual cases, the reduction in the costs of manufactured products has paid for the waste-beat installation within 2-3 years time, and in some industries, heat recovery is sufficient to produce all steam and power required.

Wickes Boilers are correctly designed and built to effect maximum heat recovery from all types of waste gases. High gas velocity, long gas travel

with minimum resistance and air-tight settings made possible by special casing construction combine to make Wickes units bigbly efficient and economical in operation. Even in cement mills where high dust content in hot kiln gases is a problem, Wickes Boilers do a thorough job of dust removal and heat recovery. Why not write for complete facts about putting wasteheat to work in your plant.

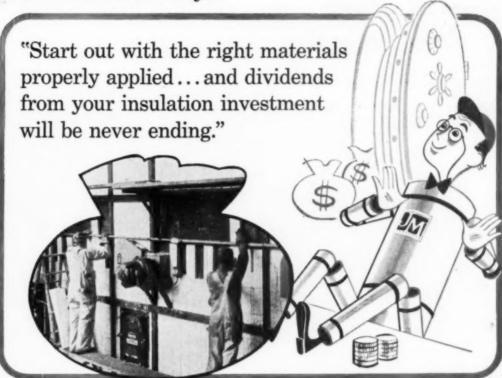


## WICKES

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QUALITY SINCE 1854 Mr. Insulation says:



Here are two important reasons why it will pay you to let Johns-Manville serve as your insulation headquarters:

YOU GET THE RIGHT MATERIALS -Regardless of the service conditions on your job, Johns-Manville has an insulation that fits the need. That's because Johns-Manville manufactures a wide variety of insulations of asbestos and other selected raw materials-for service from 400F below zero to 3000F above. Johns-Manville offers this complete line because industry requires many types of insulations and because no one material can properly serve as a jack-of-all trades for use on all jobs.

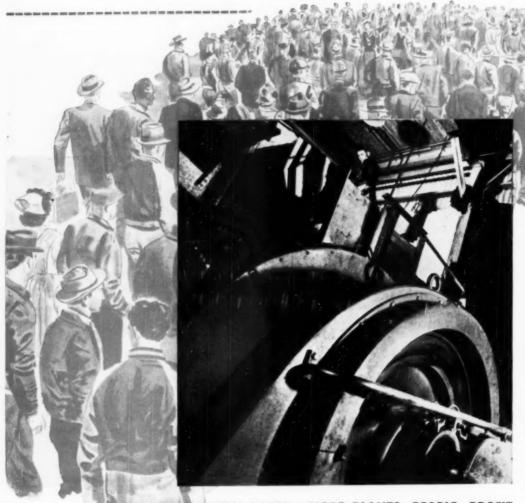
YOU GET THE RIGHT APPLICATION-Insulations serve at top efficiency only when properly applied. J-M Insulation Contract Firms have men with generations of insulation experience and training in Johns-Manville application methods. The way they engineer your job is your assurance that your insulation investment will pay a high return through the years.

Why not call on insulation headquarters for engineering advice about your insulation work. J-M Insulation Engineers are available to help select the right insulation for your particular service conditions. Write Johns-Manville, Box 290, New York 16, N.Y.

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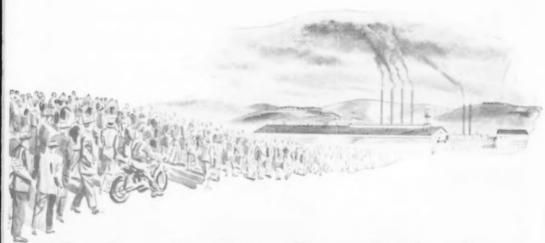
### YOU CAN BE SURE .. IF IT'S Westinghouse



#### SOUTHERN PAPER - MORE PLANTS, PEOPLE, PROFIT

Growing factor in the Southern economy is the paper industry. In the past ten years, its labor force climbed 74%, and dollar volume jumped 43% times!

Westinghouse helps paper mills solve production problems, helps them grow For example, the big motor above, at Camp Manufacturing Co., Franklin, Va., drives a log chipper which chews up 22-inch logs like a giant's pencil sharpener. The logs fall 10 feet, crash into whirling knife blades with a battering-ram impact. No ordinary drive motor would take it, so Westinghouse engineers designed a 250-hp motor with a tremendous built-in flywheel effect. This motor stores up energy, stands the impact and keeps Camp turning out chips for paper production.



# Why has the Southern labor force jumped 50% in ten years?

Count up the production workers in the south—the men who turn out the goods. Since 1939, they've increased by one million men, a better than 50% gain. They're on the job in new plants and expanded plants—because abundant raw materials, good markets and transportation make the South an excellent place to do business.

Early in our company's history, Westinghouse realized these advantages and built manufacturing plants in the South. Today our 15 Southern plants pay wages to almost 4,000 employees. They buy raw materials from Southern mines, mills, farms and forests. And they produce top-notch electrical equip-

ment that helps other industries expand in the South.

Abundant power is one of the big factors in Southern growth. And much of the apparatus generating the South's power was engineered by Westinghouse. At the same time, the best in electrical using equipment supplied by Westinghouse helps Southern industries get the most out of this power. The paper mill equipment on the opposite page is a good example.

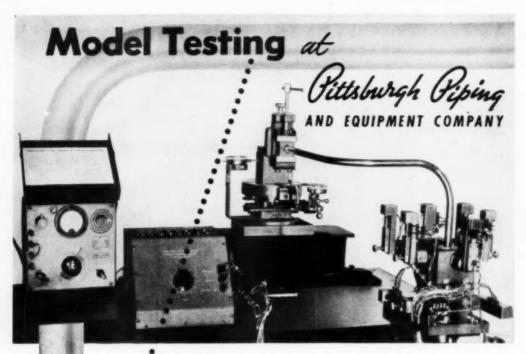
Westinghouse has deep roots in the South, a basic stake in its future, and a firm understanding of the problems of Southern industry and power. And that makes your Westinghouse office a good place to go when you have a job for electricity.

J-94828

Westinghouse
A BASIC PART

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## The Modern Method for Complete, Practical Pre-determination of Piping Flexibility

Model testing is one of the many technological advancements thoroughly investigated and proved by Pittsburgh Piping and Equipment Company before being made generally available. It provides complete advance knowledge of the reactions of any type, size, and system of power piping.

The testing apparatus shown above accurately measures and directly indicates the physical reactions of a section of pipe which exactly duplicates, in miniature, the planned layout. These measurements are projected to

give precise information on the full size system as a check against theoretical calculations.

On complex piping layouts, model testing provides a complete analysis instead of theoretical approximation; it is a time and labor saver; and the possibility of mathematical error is minimized. Its use helps to avoid excessive stresses, reactions, and movements in the final system which could affect joints and thus cause leakage, or damage anchors and equipment connected to the pipe line.

ment connected to the pipe line.

Look to Pittsburgh Piping and Equipment Company for leadership in methods that assure greatest safety, highest efficiency, and longest service from high temperature, high pressure

piping.

Model Testing makes possible the planning of high-pressure, high temperature piping systems with accurate advance knowledge of end reactions, stresses, and strains encountered in actual operation.





#### Controlled Volume Pumps Aid Paint Blending

PAINT blending operations were being performed by manual methods; for each particular shade of color required it was necessary to weigh each individual quantity of dye on a scale before adding it to a 100 gallon mixing tank. This, of course, was extremely time consuming. It was also necessary to discard an occasional blend because a slight error in weighing would be made.

Four controlled volume pumps

manufactured by Milton Roy Company are now in operation pumping the 10 per cent acid dye in glycol ether solution with precise accuracy. Variations in capacity of each pump between 50 and 150 gallons per hour are easily effected by a stroke length adjustment. Required volumetric ratios of any

of the four colors, blue, red, yeslow, or black are held to within tolerances of less than 1 per cent by the double-ball check liquid end of the pumps.

Substantial savings in labor costs have been effected by elimination of the manual weighing and pouring operations. A continuous blending system can now be employed and the precise metering of the dyes by the pumps improves product quality and eliminates off-color runs.

#### Case 80—Texas Metalworking

#### New Die Reduces Forming Time

THE development by production engineers of Texas Engineering and Manufacturing Company, Inc., Dallas, Texas, of a combination blank and form die for a 16 ft Cincinnati press brake has enabled TEMCO to reduce fabrication time on aluminum spray rails for the Lone Star Boat Company by more than 80 per cent, according to Wilhelm Bischoff, TEMCO superintendent.

The new die, Bischoff said, permits the forming of the entire part in one operation as against 11 previously required; and at the same time, due to sectionalized construction, the same die can be used to form parts of eleven different lengths ranging from 84 to 195-in

#### Old Method

The spray rails are fabricated from 4-inch .040 2450 coil stock into which a stiffening bead is formed. When TEMCO first started making the parts, the procedure consisted of first laying the stock out on the table and cutting it to random length. The bead was then formed with three separate brake operations, after which the pieces were cut to exact length. They then moved to a punch press where two separate operations were required to flatten the ends, and finally the corner

TEMCO OF DALLAS, TEXAS, REDUCED FABRICATION TIME BY MORE THAN 80 PER CENT ON ALUMINUM SPRAY RAILS FOR THE LONE STAR BOAT COMPANY WITH A COMBINATION BLANK AND FORM DIE FOR THIS 16-FT CINCINNATI PRESS BRAKE.

radii were cut with snips, a matter of our additional operations.

#### New Procedure

With the new die, the coil stock is fed direct to the brake with power rollers controlled by a foot button, and a single stroke of the brake forms the part, flattens the ends, cuts the part to exact length, and cut the corner radii.

Using the new method, one operator and one helper are turning out as many as 900 parts in an eight hour day.

As mentioned above, the same die can be used to form any one of eleven different length parts, due to sectionalized construction. The two end sections incorporate the blanking dies and are set up for the required length. Straight form dies of different lengths are then used to fill in between the two blank and form sections.



Case 79-Kentucky

#### Brushes Speed Metal Finishing Operation

A LARGE Kentucky manufacturing company reports increased output combined with better surface finish on stainless and carbon steel golf club heads has been obtained by power brushing since changing over to Monarch sections manufactured by The Osborn Manufacturing Co., Cleveland.

In the case of the carbon steel heads, brushing is the last finishing operation prior to plating. In the case of the stainless steel heads, the brush applies the final finish. The action of the fiber brush is that of blending imperfections and surface irregularities rather than the actual removal of metal, as is obtained with set-up wheels or abrasive belts.

The Osborn brush is used on a buffing lathe at a speed of 1750 revolutions per minute. It is the final operation following grinding, and set-up wheel polishing. On stainless steel club heads, the brush smooths and blends out all previous wheel and grit marks plus adding a lustrous satin-like finish.

#### Case 81—Georgia and Tennessee

#### **Diamond Coping Wheels Serve Quarries**

DURING the past three years, one of the most significant developments in the granite and marble quarries of Georgia and Tennessee has been the introduction of segmental diamond coping wheels for the cutting of pleats, flutes and similar designs in stonework for both the monument and building trades.

As a result, diamond coping wheels are replacing the old solid

abrasive coping wheels formerly used in many quarries and sheds and some users have reported their production with these newer segmental wheels has increased by from 300 to 400 per cent.

Diamond coping wheels were designed especially for the better designed, adequately powered machines which were engineered for high precision grinding. With these new segmental diamond coping wheels and these new and improved machines it is possible for users to cut within 1/32-in. of the prescribed size of marble and granite, compared with the ½-in. and 3/32-in, tolerance formerly required.

Not only are diamond coping wheels faster and more accurate than the old solid abrasive coping wheels, but they produce finer quality surfaces, enabling users to eliminate one or two steps in their operations. This, of course, effects substantial savings in time, material and money.

#### Case 83-New Mexico

#### **Automatic Hoist**

PECIAL "push button" drive and control equipment, developed by engineers of the General Electric Company has enabled a new mine hoist at Carlsbad, New Mexico, to raise and dump eight tons of potash ore per minute automatically from 1150 ft below ground.

Installed at the Potash Company of America mines, the new hoist will speed production of potash for fertilizer which is essential in maintaining a high level of food production.

Driven by two 500 hp G-E motors, the hoist alternately sends two ore buckets, called "skips", down the 1159 ft vertical shaft, waits long enough for a bucket to be filled by a gravity chute, and starts upward with the eight ton load.

In the meantime, the other bucket has automatically dumped its load of ore and is on the way down to repeat the cycle. Although full hoisting speed is 1500 feet a minute, the G-E control system automatically decelerates the hoist as the buckets approach either end of the lift to prevent overspeeding and overtraveling.

While normally ore hoisting is carried on automatically, a hoistman is on duty to initiate the starting and stopping of the day's production or otherwise direct the hoist's movements when necessary. Thus, the hoistman's work is made easier and the usual high maintenance cost of the loading and dumping mechanism is minimized.



Case 82-Maryland

#### Special Saw Solves Melting Problem

THE problem of melting obsolete drop hammer dies too large to go into a furnace, has been solved at The Glenn L. Martin Company through the use of a saw developed by Jay M. Boyd, Jr.

The saw, designed on the principle of a band saw, will cut large dies into pieces. Dies weighing approximately five tons each have been sawed in two in 55 minutes by the new saw, which will cut any type of die—steel, zemak or lead.

Only one person is required to operate the saw, no skill is needed, and there is no danger to the operator. The saw has a counter-balance, and is built on the principle of a see-saw. It is not only easy to operate but easy to move around.

Before the development of this saw, dies which were too large to go in the furnace were sometimes burned in half, and sometimes sheared in half on a hydraulic press. It took from six to eight hours to burn one of these large dies in half, and shearing took four hours.

The use of the new saw also saves the time required to transport a die to and from the hydro-press, and saves wear and tear on the hydraulic press.

### Continental SCREW CONVEYORS



HELICOID AND SECTIONAL FLIGHT SCREW CONVEYOR



RIBBON CONVEYOR



0



ENCLOSED

COUNTERSHAFT

BOX ENDS

EARBICATED STEEL

FABRICATED STEEL
BOX END WITH
CONTINENTAL SKF
PILLOW BLOCK, AND
SPLIT DUST SEAL
GLAND

HANGERS

CAST IRON
OUTSIDE PATTERN
BOX END WITH FEET

Continental Screw Conveyors are manufactured in all types, and are favorably known throughout the trade. Standard Parts can be shipped from stock. When complete installations are re-

When complete installations are required consult Continental Engineers. We also manufacture conveyors for special applications.

Send us your orders.











Industrial Division CONTINENTAL GIN COMPANY Birmingham, Alabama



Reduce operating expense . . .

Efficient Dixie Dust Control collects and reclaims waste particles of raw material. Cleaner air makes replacement of fine machine parts less frequent, reduces maintenance cost.

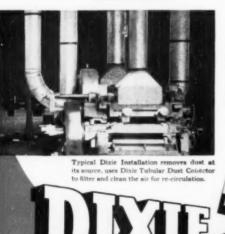
#### Increase output . . .

Individually-designed Dixie systems collect industrial dust at the machines as it forms. Clogging and breakdowns are reduced, productive machine hours are increased. Cleaner, safer conditions attract the better workers, help them produce at peut efficiency. Let a Dixie engineer show you how a dependable Dust Control system can assure greater profits for you.

#### Bring your Dust Problems to DIXIE

for

- 1—CAREFUL Analysis
- 2-50UND Engineering
- 3-DEPENDABLE Construction and Installation



#### FREE BOOK-

For information and data on dust collecting systems write for Dixie's booklet 47-B, "DUST COLLECTORS" There's no obligation.



Case 84—Georgia

#### Engineering Service Helps Production

THE Atlantic Steel Company, Atlanta, Georgia, was organized in 1901 and has grown steadily until today it operates three 72-ton basic open hearth furnaces and produces 180,000 tons of ingots annually. The company produces a much wider variety of finished products than most large steel mills, and also supplies die forgings, casting, special shapes, etc., to fabricators and equipment manufacturers.

#### Engineering Service

Atlantic makes an especial effort to help its customers with their production problems by offering the services of its trained engineers, and metallurgists for determining the best specifications and designs to facilitate customer operations. Through the use of complete customer manufacturing records, Atlantic is frequently able to recommend the most suitable steel for a particular application, and make suggestions which aid the customer to attain better production at lower cost.

#### Implement Manufacturers

This company has been particularly active in supplying needs of agricultural implement manufacturers for forgings and fabricated parts. Several implement manufacturers are now using Dixisteel closed-die forgings, instead of iron and steel castings. These forgings offer greater strength with less weight, greater uniformity, and the machining costs to the customer are less for forgings than for castings. Also, through the use of streamline production methods, they are able to furnish at lower cost many fabricated parts which the customers formerly produced themselves.

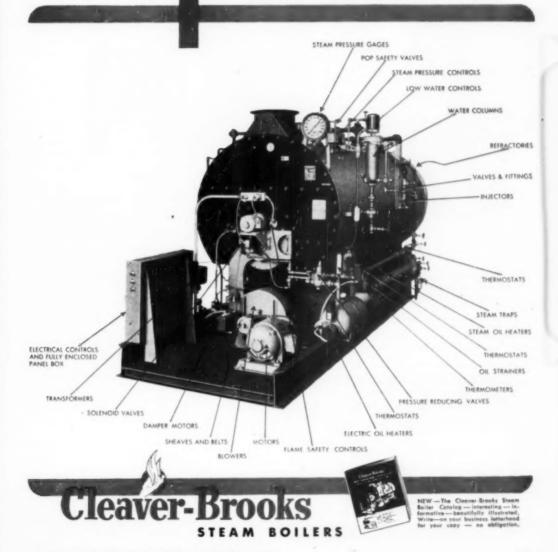
Atlantic's recently enlarged and improved metallurgical and testing laboratory has played an important part in enlarged customer services, as well as solving the company's own production problems.

# Matched quality components

#### another reason why you get a greater return from your investment in a Cleaver-Brooks Steam Boiler

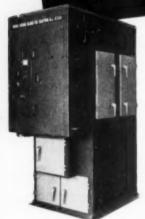
Cleaver-Brooks steam boiler quality is the sum of many qualities. From the rolling-in of the first tube and through every step to completion, the highest standard of engineering, material and workmanship prevail. Every component is the tested product of a manufacturer of known standing — carefully selected by Cleaver-Brooks engineers through test and research.

Your Cleaver-Brooks boiler is the end-product of many specialized engineering talents and manufacturing skills. When you install Cleaver-Brooks you have a steam boiler of foremost quality — with immediate and long-range cost-saving advantages. Cleaver-Brooks self-contained Boilers — 15 to 500 HP 15 to 250 lb. p.s.i.— for oil, gas, combination oil and gas firing. CLEAVER-BROOKS CO., 365 E. Keefe Ave., Milwaukee 12, Wis.



## YOU'RE SURE YOU'RE RIGHT.... WHEN YOU WEIGH FOR BATCH OR BAGGING WITH A RICHARDSON AUTOMATIC

Whatever you handle — cottonseed cake, meal, bulk peanuts, raw sugar, rice, or any lumpy, trushed or sluggish material—you're right when you weigh with Richardson Automatic Weighing Equipment.



For bulk or batch weighing try the "Class 40" Automatic Optional Feed Scale.

#### "CLASS 40" AUTOMATIC OPTIONAL FEED SCALE

- Accommodates either a belt, screw, or vibrating feeder.
- All controls separately housed and free from dust.
- Scale is totally enclosed.
- Reciprocating master counter automatically registers each weighing.
- · Available in three sizes:

E-40 (up to 200 lbs.) J-40 (up to 500 lbs.) M-40 (up to 1000 lbs.)

Multiple scale installations are possible with the "Class 40"... By means of a Richardson Master Control Panel, the weighing operation can be coordinated with allied equipment.

For fast and accurate bagging the "Class 38" Automatic Bagging Scale offers great flexibility in handling a wide range of materials. Its features...

- Adaptability to weighing dry, ground, non-free-flowing materials.
- Range from 50 to 225 lbs. per discharge.
- Speed from 3 to 6 bags per minute. Higher speed medels available.
- Adaptability to different methods of feeding controllable at scale inlet gate,
- Bagholder to suspend bag during "en-masse" discharge; for better packing and to eliminate bag lifting by the operator.

For further information, write for Bulletin No. 1449 (Class 40) or Bulletin No. 3949 (Class 38).

RICHARDSON SCALE COMPANY
CLIFTON • NEW JERSEY
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sw York • Omehe • Buston • Toronto
Philodelphiu • Minneapolis • Wichite
Houston • Son Frencisce • Montreal



€ 6743

MATERIALS HANDLING BY WEIGHT

Case 85-Kentucky

#### Design for Welding Increases

#### Production

THE B. F. Avery Company of Louisville, Kentucky, manufacturers of farm implements, recently increased the rate of production on a run of 5000 plow frogs by 50 per cent. This increase reduced costs by one-third. These savings were made by redesigning the frog from a hot-forming operation for automatic hidden are welding with Lincoln Electric's "Lincolnweld" process and equipment.

The largest single item of time in the previously used method of making plow frogs was three separate drilling operations to put holes in the frog after forming. The compound curves in the frog prevented blanking the holes before forming since they would not line up properly during the forming operation.

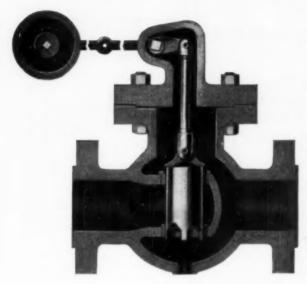
#### Operation

The present method of manufacture consists of welding together two pieces of steel to form the frog. The pieces are blanked and holes put in them during the blanking operation. After forming the two are then welded together with automatic hidden are welding.

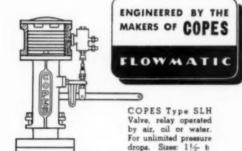
The welding head is mounted on a carriage which travels along a beam. The two frog parts are located in a simple fixture by pins and clamped with a copper faced clamp. The movement of the welding carriage is started and as it progresses along the seam, the fixture is rocked by means of a foot pedal in order to maintain a consistent spacing between the head and the work as the electrode moves along the curved seam of the joint.

This design change in the frog and the automatic welding installation reduced the direct labor on the job by one-third. No further machining operations are required on the frog after it is welded.

## BOPS BALANCED VALVES



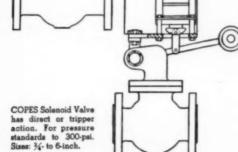
A valve may be statically balanced while at rest, yet be so badly unbalanced dynamically—when handling flows under pressure—that inaccurate response to the actuating element causes a "hunting" action which makes impossible the desired precision of control. In COPES Valves, unbalanced forces are held within narrow limits over the entire operating range. This is why so many have been purchased at a premium, where control must be precise with actuation by float, solenoid or other element. Sizes: 34-inch and up. When writing for data, give complete information on your operating needs.



10-inch.

#### NORTHERN EQUIPMENT COMPANY 1003 GROVE DRIVE, ERIE, PA.

BRANCH PLANTS: Canada, England, France and Austria
Representatives Everywhere



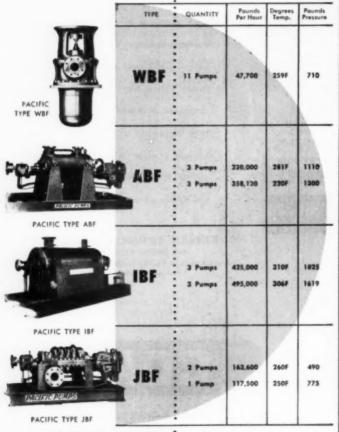
## COPES

Headquarters for . . .

Boiler Feed Water Control . . . Excess or Constant Pressure Control, Steam or Water . . . Liquid Level Control . . . Balanced Valves . . . Desuperheaters . . . Boiler Steam Temperature Control . . . . Hi-Low Water Alarms.

Now being built for

UTILITIES INDUSTRIAL **POWER PLANTS** MARINE SERVICE





### Pacific Pumps inc.

HUNTINGTON PARK, CALIFORNIA Export Office: Chanin Bldg... 122 E. 42nd St., New York Offices in All Principal Cities

NEWS

#### Automatic Names Representative In Kansas City

Appointment of Inter-State Indus-TRIAL EQUIPMENT COMPANY as its representative in Kansas City, Mo., has been announced by the AUTOMATIC TRANSPORTATION COMPANY, Chicago manufacturer of electric industrial trucks.

The newly organized sales firm is headed by EARL R. CALVIN, who formerly was manager of the industrial truck division of Mason W. Haigh & Sons, which represents Automatic in Peoria. Calvin's company is located at 3519 Troost Avenue, Kansas City. He will handle the sale of Automatic Skylift and Transporter battery powered trucks in all of Kansas and the western half of Missouri.

Before joining Haigh in Peoria, Calvin was division sales manager for the Kewanee Boiler company, Kewanee, Ill.

#### **FUTURE EVENTS** Of Engineering Interest

INSTRUMENTATION SYMPOSIUM, Chemical Engineering Dept., Tex-as A & M College, College Station, Texas.

Texas.

Oct. 11-13, Texas A & M College,
College Station, Texas.

SOUTHWIDE CHEMICAL CONFER-ENCE, H. McKinley Conway, Jr. Director, Southern Association of Science & Industry, 5009 Peach-tre Ed., Atlanta, G. Oct. 16-18, Biltmore Hotel, Atlanta, Ga.

NATIONAL SAFETY COUNCIL, R. L. Forney, Gen. Sec'y, 425 N. Michi-gan ave., Chicago 11, Ill. Oct. 18-20, 38th National Safety Congress and Exposition, Chicago, Ill.

AMERICAN SOCIETY FOR METALS. Wm. H. Eisenman, 7301 Euclid Ave., Cleveland, Ohio.
Oct. 23-27, National Metal Congress and Exposition, International Amphitheatre, Chicago, Ill.

NATIONAL POWER SHOW, Interna-

tional Exposition Co., Grand Central Palace, New York 17, N. Y. Nov. 27-Dec. 2, Grand Central Palace, New York, N. Y.

AMERICAN SOCIETY OF REFRIG-ERATING ENGINEERS, M. C. Turjin, Sec'y, 40 West 40th St., New York 18, N. Y. Dec. 3-6, Annual Convention, Hotel Commodore, New York, N. Y.

2ND PLANT MAINTENANCE SHOW, Banner & Greif, 250 W. 57th St., New York 17, N. Y. Jan. 15-16, 1931, Auditorium, Cleve-land, Ohio.

BF.7

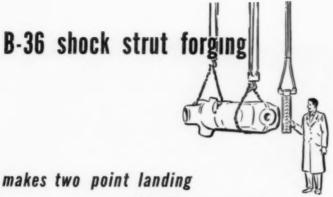
## JONES Herring Pone Herring

Single, double and triple reduction units cover every requirement in drives from 1 to 400 horsepower. Ratings and standard ratios from 1.25 to 1 to 355.8 to 1 are all shown in Catalog No. 70.

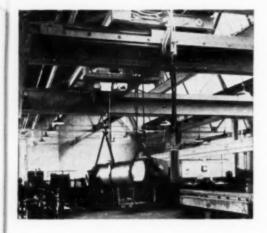
Since 1890

HERRINGBONE-WORM-SPUR-GEAR SPEED REDUCERS
PULLEYS - GEARS - V-BELT SHEAVES - ANTI-FRICTION
PILLOW BLOCKS - FRICTION CLUTCHES - FLEXIBLE COUPLINGS

JONES



with R&M flight control



At Cleveland Pneumatic Tool Co., one man "flies" these 8400-lb. forgings into position between lathe centers by means of a 10-button "flight control" panel.

This control enables the operator to raise or lower the hooks on the two electric hoists independently or simultaneously a fraction of an inch at a time, and also control the double girder 4-motor overhead traveling crane — a big advantage in handling these giant forgings with a light touch.

Whether you are handling guns or butter, take it up with R & M. An expert survey of your requirements by our nearby R & M representative involves no obligation, and usually results in faster products handling — for less money.

Write for bulletin 100SP.

ROBBINS & MYERS ...

MOTORS HOISTS CRANES

HOIST AND CRANE DIVISION, SPRINGFIELD 99, OHIO

#### Fairbanks-Morse Opens Charlotte Office

According to Mr. G. A. Hawkins, Southeastern Branch Manager of Fairbanks, Morse and Company, Atlanta, a sub-branch of Fairbanks, Morse and Company has been opened in the Liberty Life Building, Charlotte, N. C. Mr. J. R. Frost has been appointed manager of the new office. Its opening will mark another milestone in the company's growth.

The branch, under the supervision of Mr. Frost, will serve the Charlotte area with the company's products consisting of diesel engines, pumps, electric motors, water systems, scales and other items.

#### Allis-Chalmers-Alabama

THE MORGAN ELECTRIC Co., 301 Henry St., Gadsden, Ala., has been named a dealer for Allis-Chalmers motors and controls in the state of Alabama. R. R. Morgan, Sr., is owner of the firm.

#### Bridgeport Brass Houston Manager

THE BRIDGEPCRT BRASS COMPANY has announced the appointment of Mr. E. D. CASEDAY as their HOUSTON District Sales Manager to succeed Mr. George Chatneuff.

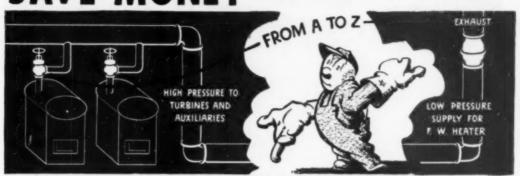


E. D. Casseday

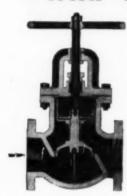
Mr. Casseday has been connected with the copper and brass industry for the past fifteen years, with experience in both the condenser and heat exchanger fields, as well as in plumbing and heating.

In his new position at Houston, Mr. Casseday will be responsible for the sale of all Bridgeport products in Southeastern Texas.

## SAVE MONEY IN YOUR PLANT



### -with FOSTER AUTOMATIC VALVES



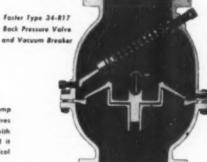
FOSTER AUTOMATIC
NON-RETURN
Step and Check Valve, Type 2

Automatic Non-Return, Stop and Check Valves save money by doing their job perfectly—with the absolute minimum of attention—for years. It is not unusual to find these volves still giving good service after 25 or 30 years and more. Today's valves are even better.

There's nathing skimpy about a Fester Type 2. Full pipe area means negligible pressure drop across the valve. Heavy duty, through balted construction makes it safe to work under when the boiler is down. Lew pressure types to 250 lbs. Istacked have semi-steel badies, branze trimmed, with stainless steel seat rings; high pressure types to 1,500 lbs. have cast steel badies, trimmed with special heat resisting, corrosion resisting allays. Piston chambers are renewable. They're built for lifetime service. Globe, angle, or elbew, from 2 ½," to 12".

Z... The R-17 Back Pressure Valve saves money by keeping the pressure where you want it on the exhaust side—for your feed water heater or other low pressure equipment—with a minimum of maintenance. Large pipe area, and large valve area mean low pressure drap across the valve, and sensitive action at low pressures. Saves make-up steam. Adjustable in ounces.

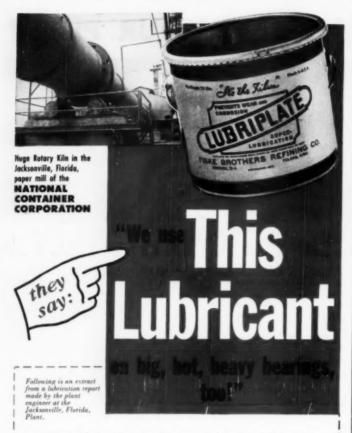
The R-17 has no outside stuffing boxes or external weights. Leading spring is on the atmosphere side of the valve and is accessible for inspection through a large handhole. Renewable seat ring and dash pot.  $2\,\%_2^-$  to  $2\,0^-$ , (with sizes from  $4^-$  to  $1\,2^-$  stocked).



Governors, Float Valves, Safety Valves, Check Valves, Relief Valves and Safety Valves are designed and built to save money, by giving reliable, trouble free regulation with a minimum of maintenance. When you select the proper Foster Valve and Install it correctly, you are making a sound investment, backed by more than 70 years of practical experience in building good valves, and our reputation for service.

## FOSTER ENGINEERING

 Company
835 LEHIGH AVENUE · UNION, N. J.



7' diameter by 300' long lime kiln, supported by five sets of trunnion rollers.

Temperature inside kiln at hot end is approximately 1800° F.

Kiln turns at approximately 1 RPM, trunnions turn at approximately 3 RPM on 7° journals in sleeve bearings lubricated by LUBRIPLATE. No. 8.

Since changing to LUBRIPLATE No. 8 two years ago, wear on all bearings and journals has been reduced to a minimum, where formerly a definite problem of lubrication existed.

It is in these unusually severe applications where LUBRIPLATE Lubricants dramatically prove their outstanding qualities. Probably more seemingly impossible lubrication conditions have been satisfactorily met with LUBRIPLATE in the past twenty years than by any other group of lubricants.

In most instances, Lubriplate Lubricants have been introduced to solve a difficult lubrication problem. Their performance is so remarkable that their use is extended throughout the plant. They definitely reduce friction and wear, prevent rust and

corrosion and save power.

LUBRIPLATE Lubricants are available from the lightest fluids to the heaviest density greases...a product for every lubrication requirement. Let us send you case histories of their use and savings in your industry. Write today.

LUBRIPLATE DIVISION

Fiske Brothers Refining Company Newark 5, N. J. Toledo 5, Ohio

DEALERS EVERYWHERE—CONSULT YOUR
CLASSIFIED TELEPHONE BOOK

## LUBRIPLATE

THE MODERN LUBRICANT

#### United Centrifugal Pumps-Houston

For the purpose of furnishing more comprehensive engineering and sales service to the mid-continent area, UNITED CENTRIFUGAL PUMPS, Division of United Iron Works, recently opened a regional office in Houston, Texas.



Halley Johnston

The new office is managed by Mr. Halley Johnston, who acts in an advisory and supervisory capacity over the activities of the Houston, Tulsa, St. Louis and Denver district offices.

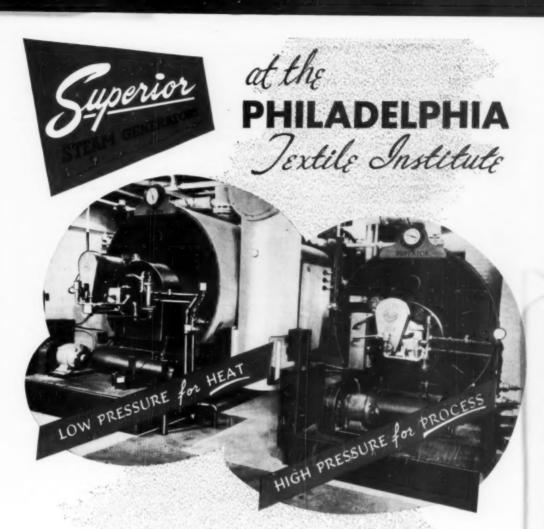
#### Diesel Power Co.-Tulsa

DIESEL POWER COMPANY, General Motors Diesel Distributors of Okla-HOMA CITY and TULSA, announces the appointment of Free Winn, Jr., as sales representative operating out of the Tulsa office.

Mr. Winn received his degree of Bachelor of Science in Mechanical Engineering at Rice Institute in 1945, and a degree of Master of Science in Mechanical Engineering at Oklahoma University in 1947. Since that time, he has been in the employ of a large petroleum equipment supplier.

#### Borden Metal Products-Alabama

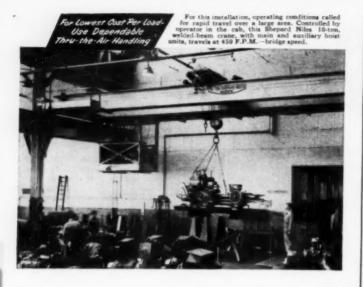
The Borden Metal Products Company, Elizabeth, N. J., has started construction of a plant at Leeds, Alabama, to manufacture floor gratings and safety steps. Power for the new plant will be purchased from the Alabama Power Company. Full production is expected to be under way in about six months.



In search of new techniques and lower operating costs (of which cost-of-steam is an important factor) the Philadelphia Textile Institute conducts constant research for the Textile Industry . . . and for their new Scholler Laboratories, where much of this research is carried out, Superior Steam Generators were chosen because of their recognized economy of operation and low cost steam production. The two units shown supply heat for the entire building and process steam for Scholler Laboratories, as well as for Althouse and Buclington Laboratories. If you use steam for heat or process, you'll want the details given in Superior Steam Generator Catalog 211.

18 sizes from 20 to 600 bhp. . Fully automatic with any grade of oil, gas, or both. . More than 80% thermal efficiency guaranteed.





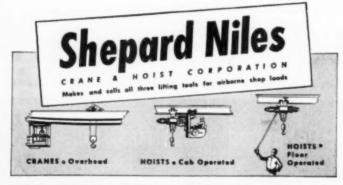
### we start by asking "What"

WHAT are your problems? Under WHAT conditions will your crane be operated—intermittently, or under fairly constant conditions? WHAT are the operating speeds necessary to meet your productive cycle?

Your answer to these and similar questions will enable us to engineer your installation so that it will give you the best, and longest service—at the lowest cost per load over the years.

Be sure you get the crane best qualified to do your job. It's wise—and costs you nothing—to get the facts first, rather than to make expensive changes later.

May we place our experience of a great many years of successfully designing all types of crane installations at your disposal?



455 SCHUYLER AVENUE . MONTOUR FALLS, N. Y.

#### Graver Appoints Shuff in Atlanta

GRAVER WATER CONDITIONING CO. announces the appointment of Evans L. Shuff & Associates as its representative for the ATLANTA territory, with headquarters at 303 Five Ivy Building, Atlanta 3, Georgia. Since graduating as Mechanical Engineer from the University of Kentucky in 1910, Mr. Shuff has specialized in the power plant and industrial fields, and has had extensive experience with the water conditioning problems throughout the Southeast. In his work with Graver, Mr. Shuff will be assisted by WILLIAM V. BISHOP, who was graduated from Alabama Technical Institute as Mechanical Engineer in 1947

The Shuff organization will provide engineering and sales service on Graver zeolite softeners, hot and cold process softeners, deaerating heaters, chemical feeders, filters and other equipment for the removal of all suspended, dissolved and gaseous impurities from water for power, industrial, municipal and special process plants.

#### Alloy Steel Products Co.— Southwest

THE ALLOY STEEL PRODUCTS CO., INC., of Linden, N. J., manufactuurers of stainless steel valves and fittings, recently appointed S. W. Collins as Sales Representative for the states of Oklahoma and Kansas, with offices at 419 Ritz Bldg., Tulsa 5, Oklahoma. Mr. Collins was formerly Assistant District Manager in the Oklahoma area for Oklahoma Refinery and Machinery Company.

#### Westinghouse— Atlanta and Charlotte

Appointments of two electronics sales specialists for the Southeastern District have been announced by the Electronics and X-Ray Division of Westinghouse Electric Corporation, Baltimore, Mp.

DAVID C. ABBOTT will be responsible for the application and sale of radar and communications equipment, and will have headquarters at 1299 Northside Drive, N. W., ATLANTA. GEORGIA.

Kenneth W. Eubanks will be responsible for the application and sale of radio-frequency induction and dielectric heating equipment, and industrial electronic devices. He will be located at 210 East Sixth St., Charlotte 1, N. C.



grinding stainless steel sinks . . . and innumerable other metal grinding, cutting and finishing jobs.

> BAYFLEX abrasive products might be the answer to your grinding problems. Write us for a free demonstration.

BAY STATE ABRASIVE PRODUCTS CO. Westboro, Massachusetts, U.S.A. Chicago, Cleveland, Detroit, Pittsburgh Distributors - Principal Cities





Top Performance Consistently Duplicated



#### Plant Maintenance Show— Cleveland

The PLANT MAINTENANCE SHOW, which was conducted for the first time early this year, will be held again at the Auditorium, in Cleveland, O., Jan. 15-18, inclusive.

On exhibition at the show will be equipment and materials for air conditioning, heating, ventilating, building materials and services, maintenance tools and supplies, electrical equipment, employee relations, training and safety, instruments, meters, gauges, lubricants and lubricating equipment, management consultants and services, materials handling, mechanical rubber goods, paints, painting equipment, product finishes, power generation and distribution, power transmission, and welding and gas cutting.

Advance registration cards and hotel information may be obtained from Clapp & Poliak, Inc., 341 Madison Avenue, New York 17, N. Y.

#### Hewitt-Robins, Inc.-Norfolk

Appointment of C. E. Thurston & Sons, Inc., 30-32 Commercial Place, Norfolk, Va., as distributor of Hewitt Rubber Division products in the Norfolk area has been announced by Hewitt-Robins Inc., of New York.

#### Graver Water Conditioning Appoints Potter

Graver Water Conditioning Co., manufacturers of equipment for all water-treating processes, announces the appointment of James T. Potter as its representative for the states of North and South Carolina.

Mr. Potter has specialized in the field of water treatment for more than 20 years since he completed his studies in Industrial Chemistry at the University of Kentucky and Chemical Engineering at the University of Alabama. Throughout that time he has familiarized himself with the special conditions and requirements of the Southeast.

Mr. Potter's headquarters are at 1521 Stanford Place, Charlotte, North Carolina. He will provide engineering and sales service on Graver zeolite softeners, hot and cold process softeners, chemical feeders, filters, and other equipment for the removal of suspended, dissolved and gaseous impurities from water for power, industrial, municipal, and special process plants.

### Money Saving Steam Traps with the Strainers <u>Built Right In</u>

. . . Now Available in Two Sizes

FIRST-THE ARMSTRONG No. 880 AND NOW-THE LARGER No. 881

VITAL STATISTICS

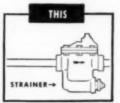




No BBO No

Pipe Connections	1/2" or 3/4"	1/2" or 3/4"
Operating Pressure	150 psig	250 psig
Capacity, Ibs. per hour continuous discharge	450-690	760-1060
Height	5%"	71/16"
Diameter	5"	5"
Weight	5 lbs.	6 lbs.





AN ECONOMICAL steam trap for draining small equipment naturally has a small discharge orifice. When dirt or scale conditions are bad it is recommended that a strainer be installed ahead of such a trap to avoid clogging.

Either the Armstrong No. 880 or No. 881 trap is a perfect answer for such a condition. In each the strainer is built right into the body, thereby eliminating a separate strainer, extra fittings and considerable installation labor. Best of all, these traps cost less than a standard trap plus a separate strainer. Look over your small trap applications and order the traps you need now from your local Armstrong representative's stock.

#### ARMSTRONG MACHINE WORKS 806 Maple Street • Three Rivers, Mich.

FOR COMPLETE DATA on correct selection and installation of steam traps for early service or only pressure, send for your capy of the 36-PAGE ARMSTRONG STEAM TRAP BOOK, or see our Catalog in Sweets or Chemical Engineering Catalog.



## ARMSTRONG STEAM TRAPS

# The STANDARDAIRE PRECISION BUILT Axial Flow BLOWER

Features Two More Vital Components:

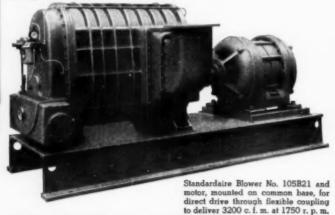
PRECISION ROLLER BEARINGS—spherical type are used on the fixed ends of the rotor shafts and a cylindrical type on the floating ends.

With such a design free aligning action of the rotor shafts is assured and specific speed, load, and service requirements are easily met. In addition, this bearing construction fully compensates for any housing distortion which might occur due to temperature differentials.



LABYRINTH TYPE OIL SEALS—Bearings and gears are lubricated by a spray of filtered oil. The oil is controlled by a balanced pressure, labyrinth type seal which gives complete oil control and assures absolutely clean air delivery under all operating conditions.

Such features as precision bearings—frictionless oil seals—hardened, shaved, helical gears—contribute immeasurably to the efficient and dependable performance of the Standardaire Blower—A Modern Machine with Superior Operating Characteristics. For further information write The Standard Stoker Company, Inc. Dept. C-25, 370 Lexington Avenue, New York 17, N. Y.



THE STANDARD STOKER CO . INC .



NEW YORK . CHICAGO . ERIE . YORK . MONTREAL

#### Georgia Power Expansion

Plans for the construction of a third 100,000 kilowatt generating unit at Plant Yates, the Georgia Power Company's new steam-electric power plant near Newnan, have been approved by the Board of Directors of the Company. The project will cost approximately \$10,000,000.

Work on the first unit was begun about two years ago, and the plant was scheduled to begin power production early in September. The second unit is expected to go into service before the end of the year. Excavation work for the third unit will be started this year. Orders for the new 100,000 kilowatt turbo-generator have been placed with the manufacturers. The third unit will begin operation some time in 1952. Plant Yates is designed so that a fourth unit may be added when needed, raising the generating capacity to 400,000 kilowatts.

Other projects of Georgia Power Company include a new 30,000 kilowatt steam-electric power plant being built at Brunswick, called Plant McManus, a hydroelectric plant at Furman Shoals, near Milledgeville, which will have a capacity of 45,000 kilowatts, and a 20,000 kilowatt addition to the Bartlett's Ferry hydroelectric plant near Columbus.

#### Instrumentation for Process Industries

The AGRICULTURAL AND MECHANI-CAL COLLEGE OF TEXAS, at College Station, Texas, will offer their fifth symposium on "Instrumentation for the Process Industries", on October 11, 12 and 13, 1950. The course will be conducted as a seminar with lectures and discussions on the subject of automatic control.

Cooperating with Texas A & M in the presentation of this course will be many industrial concerns manufacturing oil, gas, and chemical products. Manufacturers of instruments and automatic controls are taking part by arranging to show educational exhibits and provide lecturers. The lectures will cover measurement and control of temperature, pressure and liquid level, time control, and other allied subjects.

Registration fee is \$5.00; pre-registration by mail is encouraged. Further information may be obtained by writing Professor P. G. Murdock, Chemical Engineering Department, Texas A & M College, College Station, Texas.

## HAGAN controls and meters

#### AT ARTLOOM CARPET COMPANY, Inc.

When Artloom Carpet Company, Inc., Philadelphia rug manufacturers, needed increased factory space a few years ago, they decided to eliminate a stand-by boiler room. This was made practicable by modernization and expansion of the regular power plant.

The first step in the program was the purchase of a new boiler and necessary auxiliaries—and the immediate installation of Hagan combustion controls and Hagan Ring Balance instruments on the two old boilers so as to bring

up their efficiency. Provision was made at the same time for centralized control of all boilers.

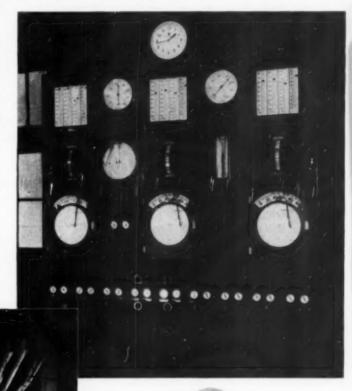
The Ring Balance Boiler Meters are of the indicating and recording type. Integrators automatically total steam flow from each boiler. A third pen records stack temperature.

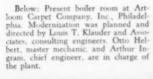
On all three boilers, stokers and fans are turbine driven. Combustion conditions are regulated by direct speed control of stokers and fans. Rated capacity of the old boilers is 50,000 pounds per hour, of the new boiler 65,000 pounds per hour. There are load swings of as much as 30,000 to 35,000

pounds per boiler from the low at night to the peak demand when the dye shift begins work in the morning.

The controls and meters have given complete satisfaction, and have required no attention except routine maintenance since they were placed in operation.

For full information on Hagan Controls and Hagan Ring Balance Flow Meters, call the nearest Hagan representative or write to Hagan Corporation, Hagan Building, Pittsburgh 30, Pennsylvania.

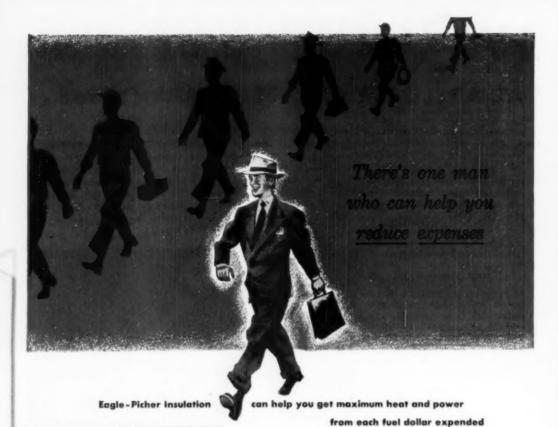






#### HAGAN CORPORATION

BOILER COMBUSTION CONTROL SYSTEMS
RING BALANCE FLOW AND PRESSURE INSTRUMENTS
METALLURGICAL FURNACE CONTROL SYSTEMS
THRUSTOR, FORCE MEASURING DEVICES



Here's insulation that will save you money

#### EAGLE-PICHER DE-85 BLOCKS

A highly efficient, rigid-type insulating material composed almost entirely of pure, lightweight, Eagle-Picher Diatomaceous Earth. High physical strength enables these blocks to stand up under usage normally encountered in installation. Adaptable to virtually all types of heated equipment. Can be cut with a knife, or sawed, to fit irregular shapes. DE-85 Blocks for temperatures to 1300°F. DE-95 Blocks for temperatures to 2000°F.

#### EAGLE-PICHER

Finishing cement for temperatures up to 1000°F. Adheres tightly to hot or cold surfaces with practically no shrinkage. Highly durable, Gives a smooth, hard, light-colored, paintable surface.

#### EAGLE-PICHER STALASTIC

(Boiler Wall Coating)

Effectively seals against air infiltration through boiler settings—seals cracks and pores, effects substantial fuel savings. Great adhesive strength, retains its elasticity. For temperatures up to 400 F.

An Eagle-Picher Industrial Insulation distributor or representative can help you reduce operating expenses because he has available a wide line of insulation products—for high and low temperatures—scientifically designed for maximum thermal efficiency, and practical application. Why not let him give you more information about some of the products listed here?

These Eagle-Picher products can save you money . . . power . . . time

Insulating Felts • Supertemp Blocks • Blankets
Loose Wool • Pipe Covering • Stalastic • Insulseal • Insulstic
Swetchek • Finishing Cements • Insulating Cements
Fireproofing Cement • Diatomaceous Earth Blocks

#### THE EAGLE-PICHER COMPANY

General Offices: Cincinnati (1), Ohio

Insulation products of efficient mineral wool—for a full range of high and low temperatures. Technical data on request.

\$100 × 2101



Since 1843

### 19TH NATIONAL EXPOSITION OF POWER AND MECHANICAL ENGINEERING

November 27-December 2, 1950 Booth 324-326, Grand Central Palace, New York

Get maximum
fuel savings and exact
temperature control
with these versatile,
efficient insulations

For a completely effective, low-cost insulation combination, you can't beat the teamwork of Eagle-Picher Supertemp Blocks, Diatomaceous Earth Blocks #85 (for temperatures to 1300°F.) and DE Blocks #95 (for temperatures to 2000°F.), Eagle-Picher Super "66" Insulating Cement, and Eagle-Picher Insulseal. They work effectively to give your equipment the highest possible thermal efficiency . . . cut operating costs by saving maximum amount of fuel . . . and help to provide perfect, precise control over temperatures.



#### EAGLE-PICHER SUPER "66" INSULATING CEMENT

Super "66" is all-purpose, rustinhibitive, extremely adhesive insulating cement. "Springy ball" pellets don't collapse after application... give great coverage, retain their thermal efficiency. 100 lbs. covers 65 sq. ft.—1 inch thick! Easily applied with trowel, over flat and irregular surfaces. Efficient for temperatures up to 1800° F. Reclaimable when used on equipment whose temperatures go up to 1200° F.



#### EAGLE-PICHER SUPERTEMP BLOCKS

Eagle-Picher Supertemp Blocks are lightweight (approximately 16 lbs, per cu, ft.). Can be cut easily with knife or saw to fit off-shaped areas . . . they fit snugly over minor irregularities. They're strong and have high refractory value. Withstand temperatures up to  $1700^{\circ}$  F. Conductivity at 512° F. approximately 0.43 . . . all standard sizes, from  $3^{\circ}$  x  $18^{\circ}$  to  $12^{\circ}$  x  $36^{\circ}$  . . . in thicknesses from  $1^{\circ}$  to  $4^{\circ}$ .



#### EAGLE-PICHER INSULSEAL

A tough, weatherproof, protective coating for insulation. For temperatures up to 450° F. Applied as a plastic, its smooth troweling qualities assure uniform coverage, proper thickness. It protects insulation from air infiltration, fumes, rain, snow, vibration, punctures, and withstands severe service, indoors or out. Dries to a smooth, rich black, has a neat appearance on hot or cold surfaces . . . may be washed or painted.

THE EAGLE-PICHER COMPANY General Offices: Cincinnati (1), Ohio

Insulation products of efficient mineral wool—for a full range of high and low temperatures. Technical data on request.



Since 1843



For high-capacity, continuous cleaning, the new Hoffco-Vac #50 is the all-purpose, two-sweeper machine! Specifically designed for use where large dust accumulations are to be handled—where non-stop cleaning is necessary—or where superior separation is a requirement. Handles like lighter, smaller machines. Successor to the famous Hoffco-Vac originated in 1939, the new #50 is one of 4 sizes of portables built by Hoffman. Stationary systems available, too, in a wide range of sizes. Write today for literature.

#### HOFFMAN BUILDS MULTISTAGE CENTRIFUGAL BLOWERS and EXHAUSTERS

All capacities up to 10,000 c.f.m. and various air pressures up to 8 lbs. Low maintenance and power costs. Write for Bulletin A-650.



#### Edward Representative—Virginia

The appointment of the I. Russell. Berkness Company of Richmond, Virginia, as sales and service representatives in Virginia for Edward Valves, Inc., East Chicago, Ind., has been announced.

The firm is headed by I. RUSSELL BERKNESS, who for a number of years was a consulting engineer in Richmond and Norfolk. A mechanical engineering graduate of Purdue University, Mr. Berkness is a licensed certified professional engineer—both mechanical and electrical—in the State of Virginia.

#### Allis-Chalmers—Atlanta

CARL R. FROEBA has been named a sales representative in ALLIS-CHAL-MERS ATLANTA district office. Froeba joined Allis-Chalmers in 1948 after graduating from Louisiana State University as a mechanical engineer. He recently completed Allis-Chalmers graduate training course. He is a member of the ASME.

#### Ethyl Corp.—Houston

New manufacturing plants to increase ETHYL CORPORATION'S production of antiknock compounds will be built near Houston, Texas, and are expected to be completed by the end of 1951:

Operations at Houston will be integrated with all principal intermediate chemicals manufactured on the side. Salt brine will be piped from local wells for the manufacture of sodium and chlorine, and petroleum hydrocarbons will be piped from nearby oil refineries for the manufacture of ethyl chloride and ethylene dichloride.

Ethyl's last big expansion program was completed in 1949, increasing the capacity of the BATON ROUGE plant by more than 30%. Additional facilities which will further increase capacity are now being installed and will be in full operation by the end of this year.

Engineering plans for the plant near Houston call for the construction of units to manufacture tetraethyl lead, sodium and chlorine, sodium-lead alloy, and ethyl chloride. Other units will include lead recovery furnaces; laboratories; storage tanks for tetraethyl lead, ethyl chloride, chlorine, and ethylene dibromide; a blender; and trackage for a fleet of tank cars for delivery to customer oil companies.

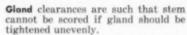


# Cast Steel Gate Valves

Series 150 and 300

Wedge Gate - Outside Screw and Yoke





Deep Stuffing Boxes in all sizes (2" to 24") insure tightness and maximum packing life — costly leaks are eliminated.

Bonnets and Bodies are engineered to withstand pressure and minimize distortion — they're tough, durable, dependable.

Heavy Steel Walls provide extra strength and longer life.

Integral Body Guide Rib Faces are machined to insure accurate disc seating.

Seat Rings are bottom seated — not flange type. No recess exists at back of ring — hence no turbulence, erosion, or pressure drop.

Streamlined Ports allow high velocity, non-turbulent flow, and reduce the possibility of erosion.

Volves regularly have flanged ends. They can be supplied with ends for butt welding. Roller bearing yokes are available. On valves 5 inches and larger, by-passes can be furnished.

For Series 600 and higher, we recommend Walworth Pressure-Seal Steel Gate Values.

For further information on Walworth Cast Steel Gate Valves, see your local Walworth distributor, or write:

# WALWORTH

valves and fittings

60 EAST 42nd STREET, NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

SOUTHERN POWER & INDUSTRY for OCTOBER, 1950

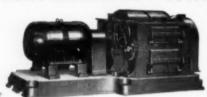
Sectional view of Series 200



# on AMERICAN CRUSHER QUALITY

Independent survey of users CHECKS TONS OF COAL CRUSHED against PARTS REPLACEMENT COSTS

# 29 COAL MINES and POWER PLANTS REPORT.



A total of 61,161,372 tons crushed.

Average age of American Crushers at time of survey— 9.35 years.

Average parts replacement cost \$.0012 per ton (Includes cost of standby parts not yet needed).

# CONCLUSION:

AMERICANS CAN "TAKE IT"!
NEEDING NEW PARTS LESS
OFTEN, THEY KEEP OVERALL
PRODUCTION EFFICIENCY HIGH

# HERE ARE A FEW CASE HISTORIES

A COAL MINE IN ILLINOIS reports 4,000,000 tons crushed over 10-year period by their American AC3-E Crusher — with a parts replacement cost of \$.0005 per ton.

AN INDUSTRIAL POWER PLANT IN WEST VIRGINIA has an American 38-5 Crusher that has reduced 10,008,000 tons over last ten years. Parts replacement cost was only \$.0008 per ton.

A CENTRAL STATION IN NEW JERSEY crushed 6,000,000 tons over a 20-year period with their American 42-S. Parts replacement cost was only \$,00025 per ton. Crusher still going strong.

CRUSH COAL AT A TOTAL COST OF LESS THAN IC PER TON ORIGINAL COST of an American Crusher . . . plus MAINTENANCE . . . plus POWER . . . plus INTEREST ON INVESTMENT averages less than Ic per ton crushed. The American Pulverizer Company has many case studies to prove this fact.

Let an American Representative analyze your crushing problem.
Write for details on the complete line of American Crushers.

PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1243 MACKLIND AVE. ST. LOUIS 10, MO.

# Reliance Appoints Leitner

Frank W. Leitner, formerly an engineer with the Graniteville Company, has been appointed a sales engineer for the Reliance Electric & Engineering Company. He will be located in the Reliance office in Charlotte, N. C., and will act as sales engineer for all Reliance products in North and South Carolina, reporting to Emory G. Orahood, Southeastern District manager whose offices are in Atlanta.

# Bay State-Alabama and Georgia

BAY STATE ABRASIVE PRODUCTS Co., Westboro, Mass., have announced the following new distributors in the Southern area: Charles Temerson Sons Co., 4th Street, Tuscaloosa, Alabama, will act as distributor in northern and southern Alabama and most of Mississippi.

DEJARNETTE SUPPLY Co., 1001 Boulevard, N. E., ATLANTA, GEORGIA, will represent the company in Fulton, De-Kalb, and Cobb counties.

# Warren Purchases Quimby Pump

Announcement is made by War-REN STEAM PUMP COMPANY, INC., that negotiations have been concluded for the purchase of QUIMBY PUMP DIVISION of H. K. PORTER COMPANY, INC., Pittsburgh, Pa.

All manufacturing will be transferred to the Warren Plant. It is felt by the management that the addition of Quimby Pumps will be a valuable addition to the present Warren line. A Repair and Spare Parts Service will be set up to take care of present and future users of Quimby Pumps.

# Honeywell Expands

MINNEAPOLIS-HONEYWELL REGULAT-OR COMPANY is expanding its production and promotion activities into the field of central power station instrumentation. Charles W. Bowden, of Honeywell's Brown division, has been named central stations industry manager.

More than a dozen new products have been designed for central power station application. They include instruments and pyrometer accessories for steam plants and electric distribution. A nationwide promotion of the new products will follow private showings.

"Window Shopping" for Valves is poor economy



Reading advertisements is like "window shopping" it's a good way to see what's on the market. But don't let it influence you into buying your flow control equipment from different sources.

Because if you buy all your valves from one source you avoid these pitfalls:

Complications in stocking spare valve parts.

Difficulties that confront the maintenance department in making repairs on a variety of valves.

The necessity of carrying a much larger stock of repair parts.

The chances of installing valves that are not backed by adequate engineering service.

By offering the only COMPLETE line of valves available to Industry today, Powell makes this possible. And if you consult Powell Engineers and select the right valve to suit each individual service, your flow control problems are ended.



Fig. 241-125-pound fron Body Bronze Mounted Globe Valve with outside screw rising stem, bolted flanged yoke, regrind-able, renewable bronze seat and disc.



be mailed on request.

Fig. 1367-A — Class 1800-pound Cast Steel Pressure Seal Angle Check Valve, "Y" check valves also available.

bronze disc.



Fig. 378—200-pound -Bronze Gate Valve. Screwed ends, union bonnet, inside screw rising stem and renewable "Powellium wear-resisting nickel-



Fig. 6061 W. E.-Class 600-pound Cast Steel Swing Check Valve with welding ends and bolted cap. Disc has ample lift to permit full, straightway, unobstructed flow through the valve body.

The Complete Powell Line includes Globe, Angle, "Y", Gate, Check, Non-return, Relief, and Flush Bottom Tank Valves in Bronze, Iron, Steel and a wide range of Corrosion-resistant metals and alloys.

Ask your nearest Distributor-or write direct

The WM. POWELL Company, 2525 Spring Grove Ave. P. O. Box 106, Station B, Cincinnati 22, Ohio DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

# VALVES



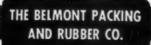
Idle equipment affects production schedules . . . influences product quality and many times cuts deeply into profits.

To keep equipment producing, use Belmont, the Packings that have individual characteristics and are scientifically designed and constructed by packing specialists to seal better and last longer.

Easy to get , , , Belmont Packings are stocked by local distributors in every large industrial center. Or, if you have a problem that requires special engineering attention, write direct.

Catalog #40 is available, write for it.

THERE'S A BELMONT PACKING FOR EVERY SERVICE



Butler and Sepviva Streets
Philadelphia 37, Pa.



RINGS • SPIRALS • COILS • REELS SPOOLS • SHEETS • GASKETS

FOR STEAM . WATER . OIL . GAS . AIR . ACIDS . ALKALIES . AMMONIA

### Commercial Solvents-Louisiana

COMMERCIAL SOLVENTS CORPORA-TION will construct a million-dollar addition to its ammonia plant at STERLINGTON, LA., to produce nitrogen solutions. The new unit will be located on the site of the present Sterlington plant which makes anhydrous ammonia from natural gas. It is expected to be in operation the first part of next year.

The Sterlington plant, constructed for the government during the war by Commercial Solvents, was purchased for six million dollars in 1946. A large amount of the anhydrous ammonia production is being used for direct application to the soil, principally in LOUISIANA and MISSISSIPPI.

### Allis-Chalmers-Tenn.

The recently organized Middle
Tennessee Armature Works, 113
Andrews St., Columbia, has been
named a dealer for Allis-Chalmers
motors, controls, centrifugal pumps,
transformers, circuit breakers and
Texrope drive equipment in 11 TenNESSEE counties.

The company was organized May 1, 1950, and is headed by S. U. Steffner. It is a certified service shop for Allis-Chalmers motors, transformers and controls.

### Anaconda Promotes West

MR. H. E. West, formerly located in New Orleans as Division Sales Manager of the Anaconda Wire and Cable Company, has been assigned broader responsibilities, which include the coordination of sales promotion activities with electrical contractors and wholesalers on a national basis. In his new capacity he will be located in Washington, D. C.

Mr. West is well known in the electrical industry, and he has been associated with the Anaconda Wire and Cable Company in various capacities in the Sales Department since 1935.

# Battery Group Changes Name

GOULD-NATIONAL BATTERIES, INC., recently became the new name of the National Battery Company.

The same sales and field engineering organizations, which have been serving heavy industry under the name of the Gould Storage Battery Corporation, will now operate under the new name of Gould-National Batteries, Inc. Headquarters for this group will continue to be located in Trenton, New Jersey.

# SIROCCO INDUCED DRAFT FANS

Standard of the World



The Sirocco Induced Draft Fan (shown above) with die-formed forward curved wheel blades is designed and proportioned specially for induced draft work. Now used on 1,000,000# /hr. steam boilers.

The high static efficiency, low RPM, low tip speed, low inlet velocity, plus other important operating characteristics, make this fan particularly well adapted to severe power plant requirements.

For complete, concise, factual data on the Sirocco Induced Draft Fan, write for Bulletin 4424.

For data on other American Blower Mechanical Draft Equipment, Fly Ash Precipitators, Heavy Duty Coils and Gýrol Fluid Drives for fan control and boiler feed pumps—consult your nearest American Blower Branch Office.

AMERICAN BLOWER CORPORATION, DETROIT 32, MICHIGAN
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONTARIO
Division of American Radiator & Standard Sanitary Corporation





American HS Forced Draft Fans



Gýrol Fluid Drives for Boiler Feed Pumps



Type ST Fly Ash Precipitators



Type VS Gýrol Fluid Drives for Mechanical Draft Fans

YOUR BEST BUY AMERICAN BLOWER POWER PLANT EQUIPMENT

AMERICAN-STANDARD - AMERICAN BLOWER - CHURCH SEATS - DETROIT LUBRICATOR - KEWANEE BOILERS - BOSS HEATER - TONAWANDA IRON

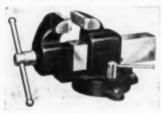
SOUTHERN POWER & INDUSTRY for OCTOBER, 1950

# NEW EQUIPMENT for Southern Industry

# Slide-Set Vise

The DODGE MANUFACTURING CORPORATION, Mishawaka, Ind., has announced a new quick action, machinist's vise, built on a new principle and embodying a

pull action which eliminates spinning the handle. It weighs 58 pounds. It is built with either a swivel or stationary base and is available in the 4-inch size only.



patented fast slide action. The product is known as the Dodge Slide-Set

The vise opens or closes to any position in one second through a push-

# Solderless Connectors

BUCHANAN ELECTRICAL PROD-L-2 UCTS CORPORATION, 1290 Central Ave., Hillside, N. J., have developed splice caps for "pigtail" splicing of electrical wires in an improved open-end construction which facilitates their installation and inspection.

These new open-end splice caps insure that wire insulation is always flush with the splice cap for maximum circuit protection and that wires are always inserted to the full



depth of the splice cap for maximum joint efficiency.

Only two sizes of splice caps are required for all most frequently used combinations of two or more wires ranging all the way from two No. 18 to three No. 8. Quickly applied snap-on insulators of fixed insulating value eliminate necessity for taping of joints and provide protection against insulation breakdown in service. The hand operated "pres-SURE-tool" installs both sizes of splice caps.

# Manzel

FORCE FEED LUBRICATION

Reaches vital parts ordinary methods can't lubricate.



Meters the precise amount of oil needed.

Gives each wearing point a full-time 'oiler



Frees manpower for more productive jobs.

Manufacturers using Manzel Lubricators report that they save their initial cost many times over in reduced labor cost, lower oil consumption, and fewer breakdowns. "Manzels" are standard equipment on many makes of engines, pumps, compressors, hydraulic presses, conveyors, and other machinery. Or...you can install them on present equipment.

Manzel representatives will gladly supply technical assistance on lubrication problems.

Division of FRONTIER INDUSTRIES INC. 315 BARCOCK ST. BUFFALO, N. Y.

# Power Belt Conveyor

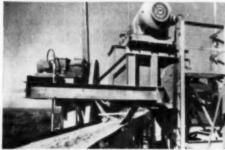
THE RAPIDS - STANDARD COMPANY, Inc., Grand Rap-L-3 ids 2, Mich., has developed a Cleated Floor-Veyor for inter-floor movement of goods. The unit is a permanently mounted power belt conveyor which transports rough or smooth surfaced cartons, bags, crates and other materials at inclines up to 45 degrees, and is designed to operate in crowded areas to allow maximum use of floor space.

The conveyor has a 10-gauge steel box-channel bed, rigidly cross braced and trussed to prevent deflection under heavy loads. It is available in four belt widths from 12 to 24 inches, with either slider or wheel bed in standard lengths from 10 to 40 feet. Pulley shafts operate in sealed, self-aligning ball bearings.

Capacity depends upon size of motor, bed construction, and operating pitch. Standard reversible belt speed is 50 fpm, with other speeds avail-

A choice of belts and cleat spacing





Drives for inclined belt conveyor and reversible shuttle conveyor, which carry rock to storage piles.



42" wide setting belt conveyor with idlers of special design to remove material from return run of belt.

### LINK-BELT COMPANY

Atlanta, Dallas 1, New Orleans 12, St. Louis 1, Charlotte 2, N. C., Baltimore 18, Birmingham 3, Houston 1, Jacksonville 2.

# at Lowest rate fares, with

# LINK-BELT BELT CONVEYORS

Continuous, steady transportation, day-in and dayout, is assured for phosphate rock on the belt conveyors shown in these photographs—and for sand, gravel, ore, coal and other bulk materials at many other installations. All are enabled to travel in large quantities, at high speeds, over long distances with minimum power and attention required.

Link-Belt designed and furnished the belt conveyor equipment, clod breaker and other handling machinery for wet rock storage and reclaiming, soda ash, ground phosphate rock and treble superphosphate at this Florida plant. Many complex problems were solved by ingenious applications of belt conveyors.

With Link-Belt Belt Conveyors you get not only properly designed terminal drive machinery and the most modern idlers and pulleys, but engineering experience to produce the proper relationship between the various components. Our engineers will gladly furnish recommendations,

# LINK-BELT



BELT CONVEYOR EQUIPMENT HILERS - TRIPPERS - BELTS - POLLEYS BEARMER - BONVE



is offered to handle many kinds of materials. The conveyor can be furnished with several types of brackets and stands for mounting on a stairway, through a floor opening or on a wall.

### Washerless Screw

RUSSELL, BURDSALL & WARD
BOLT & NUT Co., Port Chester, N. Y., has introduced a
new "washer-less" screw known as
the "Spin-Lock" in hex, pan, truss or
flat heads.

An unusual feature of the screw is the patented ratchet-like teeth on the underside of the head, which eliminates the need for a washer. Since the screw is in one piece, it can be hopper-fed. It is said to cut inventory and purchasing costs, and there are no parts to cant or fall off. Fastening is flush with surface.

# FREE READER SERVICE

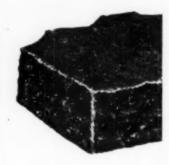
To obtain free information on this equipment, circle number on the page 17 free post card.

# Concrete Floor Hardener

L-5

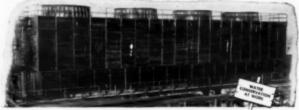
THE FLEXROCK COMPANY,
3645 Filbert St., Philadelphia 4, Pennsylvania, announces the availability of FLINTCRUST LIQUID which will keep your
concrete floors in top condition. It requires no more labor or skill to apply
than does swabbing a floor with water.

A concrete floor may look and even feel smooth. However, in reality the surface presents tiny hills and dales, as shown by the sixteen times enlarged micrograph. The hills or tiny tips, are quickly ground off by the traffic, exposing the softer, undersurface to more and more grinding off.



FLINTCRUST LIQUID is flushed over the floor and makes the surface up to ten times harder, increasing the resistance to traffic abrasion. It also penetrates and fills the pores and prevents disintegrators, such as oil, grease, acids, etc., from penetrating the concrete.





# Pritchard INDUSTRIAL COOLING TOWERS Help You Save Water!

Wherever heat is to be dissipated to the atmosphere, you can depend on a Pritchard Cooling Tower to do the job more efficiently and economically at water satings up to 99% over former wasteful methods!

Adequately sized, thoroughly engineered and manufactured of highest

quality materials, Pritchard Towers are guaranteed to meet your peak as well as your normal load requirements. Wherever you see a Pritchard Cooling Tower, you see water conservation at work.

Consult your nearby Pritchard representative for the solution to your water conservation problem.

# Write for FREE Bulletins

Prichard & Co.

Dept. No. 22 908 Grand Ave., Kansas City 6, Mo.

District Offices: Chicago • Houston • New York • Pittsburgh • Tulsa • St. Low Other Representatives in Principal Cities from Coast to Coast

### FREE READER SERVICE

To obtain free information on this equipment, circle number on the page 17 free post card.

### Reducing Valves

L-8

THE C. E. SQUIRES Co.,
18502 Syracuse Ave.,
Cleveland 10, Ohio, has introduced a new line of packless reducing and regulating valves. A
packless main stem on the reducing
valve gives a positive seal without
changing any external valve dimensions.

The valve is said to be a completely frictionless unit giving added control to a valve that already holds to one ounce pressure variation. Maintenance cost is lowered by elimination of sticking stems.

Sealing bellows of Monel and stem of stainless steel materials are standard construction. The new valves are available in kit form for changeover on existing valves, pilot and non-pilot up to 3 inches.

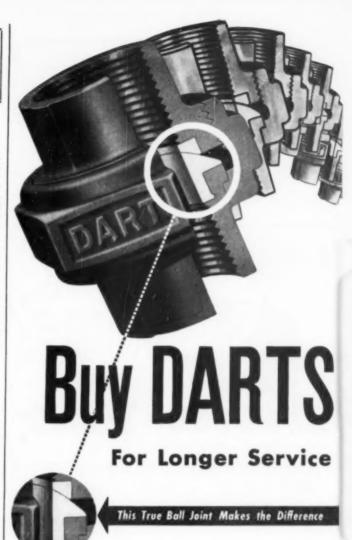
### Electric Drill

CUMMINS PORTABLE TOOLS,
Division of Cummins Business Machines Corp., 4740
Ravenswood Ave., Chicago 40, Ill., is producing a new standard duty, ½-



inch electric drill with built-in toggle type reversing switch. The new drill is designed for deep boring in heavy timbers, creosote planking, and all kinds of sappy wet lumber.

The tool turns in reverse by means of a switch. It has die-cast aluminum body and weighs 8¼ lbs. Its capacity is ½-inch in metal, 1 inch in wood. The universal ac-dc 115 volt motor develops 550 rpm no-load speed.



Easy to Tighten! Because of the spherically-ground joint, Dart unions always fit snugly — bronze seat to bronze seat. Moreover, they close easily and stay tight. No need to jam a Dart. Easy to Uncouple! Darts uncouple easily, too. Seats are unmarred—ready for repeated use.

Practically Indestructible! To ensure the ultimate in protection, both body and nut of a Dart are made of practically indestructible high-test, air-refined malleable iron. One more of the many reasons why Darts are first choice of

careful buyers coast to coast.

E. M. DART MFG. CO.
Providence 5, Rhode Island



# Intercommunication System

L-10

Talk-A-Phone Co., 1512
South Pulaski Road, Chicago 23, III., is offering intercommunication systems for all sizes of industrial plants, from those requiring only two stations to a complete two-way communication, paging, and dictating system for large organizations.

The Chief Talk-A-Phone can be used for every type of application, whether it be as all Master Stations, or a Master and Staff Stations, or a



number of Masters inter-mixed with Staff Stations. The Master Stations may talk with any other Master in the system as well as with all Staff Stations. Six, twelve, twenty, and thirty capacity Master Stations, including Redi-Power units, can be used within the same system. The Staff Station may answer Master Stations and originate calls to one, two or six Master Stations, depending on its capacity. Staff Stations converse with Master Stations only. Staff Stations are not connected to electrical outlet.

The Redi-Power unit is built to furnish a full 10 watts output and automatically supplies the exact volume needed, whether one or several stations is called. It is especially useful for paging.



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BOILER FEEDWATER TREATMENT

for More Efficient Operation / and Longer Life of BOILERS.

Special Formula for your particular Water ...

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ANDERSON CHEMICAL CO., INC.

# Induced Draft Fan Stacks

PRAT-DANIEL CORP., East Port Chester, Conn., has introduced fan stacks designed for use in small plants. The manufacturer states that the units are rigid and self supporting. Operation is said to be simple and direct, eliminating breechings and relieving the plant engineers of responsibility for draft production. Fan, breeching and stack are completely integrated and installed as a unit. This method of construction reduces initial cost and an unbalanced operating draft unit.

### Nut Setters

L-12

Keller Tool Company,
Grand Haven, Mich., announces two new angletype nut setters to provide high
torques for medium-sized nuts.

The new models, 16C-43 and 16C-46, are designed with 12:1 gearing in the gear case which, coupled with 1:1 and 2:1 gearing in the angle attachments, provides torques of 30 and 60 foot-pounds. The small, compact angle attachments adapt the tools to fast work in close quarters.



### FREE READER SERVICE

To obtain free information on this equipment, circle number on the page 17 free post card.

### Portable Grinder

L-13

SKILSAW, INC., 5033 Elston
Ave., Chicago 30, Ill., has
announced a newly designed, heavy duty, 6-in. portable
grinder.



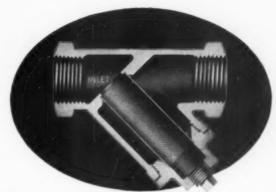
Engineered for continuous operation, Model 142 is said to be ideal for grinding heavy castings, wire brushing or buffing and polishing any metal surfaces. It prepares welding surfaces and grinds down weld beads. The grinder cuts off pins, bolts, studs and rivets; it removes heavy rust, scale and paint.

The unit weighs 19½ lbs. It has a universal motor, d-c or a-c up to 60 cycles, with no load speed of 3800 rpm. The housing is die cast aluminum. Ball bearings are sealed, and commutator and switch are fully enclosed. Length is 23½ inches.

# Connecting Links

L-14 DIAMOND CHAIN COMPANY,
INC., Indianapolis 7, Ind.,
has developed a patented
bushed center plant connecting link
for use with Diamond multiplestrand roller chain for severe service.
This connector is said to provide





# Masoneilan Strainers



# Dirt, Chips and other materials ... Protecting Equipment

Masoneilan Strainers protect pressure regulators, shut-off valves and other apparatus from possible damage by keeping out dirt, chips and other foreign materials. Screen will not leak, or buckle . . . is easily removed for cleaning. It may be installed in horizontal or vertical lines where flow is down. Safeguard your equipment, prevent possible shutdowns . . . install a Masoneilan Strainer ahead of each unit. Sizes from ½" to 1½" bronze; 2" cast iron, screwed connections; 2" to 4" cast iron, flanged connections; 125 to 250 lb. working pressure.

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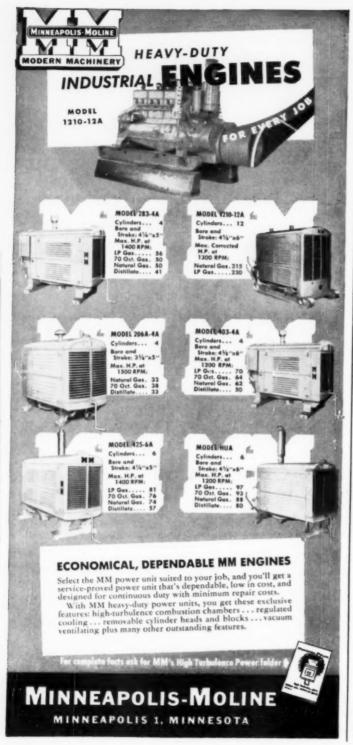
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durability, closely matching that of the Diamond press-fit center plate multiple-strand chain.

The new connectors which are being produced for ¾ inch through 2½ inch pitch Diamond multiple-strand roller chains, have file-hard bushings pressed into pitch holes of pairs of center plates making one unit with the bushings then ground for hole and pitch accuracy. Since full support is provided across all strands and both pins and bushings are hardened and polished, wear is greatly reduced.

# Haulage Vehicles

The Industrial Truck Division of the Clark Equipment Company, Battle Creek, Mich., has announced the redesigned Tructractor line of haulage vehicles, featuring increased speed, reduced size, and greater stability.

A new two-speed transmission permits 14 mph travel in high gear and 8 mph in low gear, in both forward and reverse. A shortened wheel base, which reduces over-all length, makes possible a 12-inch decrease in



turning radius. The unit has fourwheel construction and pivoted steering axle.

Distributor, starter and generator are enclosed, and spark plugs have rubber covers, to keep out dust.

The vehicles are offered in two models—"Tip" and "Dump", each with a bulk-load capacity of up to 40 cu ft, and weight-carrying capacity of 4,000 pounds.

# Stud Pullers

L-16
SNAP-ON TOOLS CORPORATION, Kenosha, Wisconsin,
has recently announced the
addition of two series of threaded
collet type stud removers and in-

serters. The smaller size unit has 14 different collets available to handle studs from ¼" to ¾" in diameter in both fine and coarse thread sizes. The larger model has 6 collets available for ¾" to 1" diameter studs in fine and coarse thread sizes.

Operation is said to be simple. The correct thread size collet to fit the thread of the stud is inserted in the housing, and the whole unit is then threaded over the stud. Turning the bolt on top draws the slotted, tapered collet up into the housing, compressing it and locking it onto the stud threads with a slip-proof grip. The collets are all keyed to prevent them from turning inside the housing. Once the tool is locked onto the stud the whole assembly becomes a rigid



unit that can be turned with a socket, Boxocket, or open end wrench. As the collets fit the threads the pull is directly from the threads only, the studs can be reset and reused again if desired.

# Featherweight Tractor

The AUTOMATIC TRANSPORTATION COMPANY, 149 West 87th St., Chicago, Ill., has developed a 1510-pound tractor that tows loads as heavy as 10 tons.





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# SOLENOID VALVES

# Built for Heavy Duty Industrial Service

NAVIS industrial-type Solenoid Valves are not to be confused with ordi-nary, low cost, commercial types. Davis products are engineered to handle the "tough jobs" on a basis of SATISFAC-TION GUARANTEED. The Davis line is complete-standard and special designs are available for every conceivable kind of automatic control application.

Our Engineering Department is always ready to essist in solving any problems regarding the use of Solenoid Valves. When sulmitting your problems, give complete information so that the proper valve may be selected for the service. Bulletin on request.



No. 93 (illustrated above) is a self-contained, pilot operated, single seated, tight closing valve, built with full port opening to insure maximum flow with minimum pressure maximum flow with minimum pressure drop. Action is visible—may be operated by hand it august from by hand it current fails. Renewable valve disc. Sizes<sup>1</sup>/<sub>2</sub>" to 4". Suitable for control service on steam, air, gas, water or oil.

which eliminates the necessity of using large tractors to carry uneconomically small loads.

# Drum Pump

THE LINCOLN ENGINEERING COMPANY, 5702 Natural L-18 Bridge Ave., St. Louis 20. Mo., announces the addition of two new heavy duty drum pumps to their



line of lubricating equipment. These new 400-lb drum size models, No. 1761 for bung-opening drums and No. 1766 for full open drums, are air-motor operated. They provide a means of pumping lubricants, sealing compounds, and other semi-fluid or viscous materials directly from original 400-lb refinery drums where abnormally low air pressures are required.

Pumps can be installed so as to deliver lubricant or materials through pipe lines to conveniently placed outlets remote from the central source, or if entire output of pump is required at one place, a hose assembly can be attached directly to the pump outlet.

### Refractory Arch

THE GEORGE P. REINTJES Company, 2517 Jefferson L-22 St., Kansas City, Mo., has developed a new double hung insulated refractory arch.

The pendulum hung feature of the arch causes each belt of supported tiles to self-align themselves and to resist pressure against the outer framework or skew-backs. For movable pit-type furnace roofs this reduces the overheating of the outer frame and consequent twisting from heated gas leakage. Each unit of the

# DAVIS REGULATOR COMPANY

2507 Washtenaw Ave., Chicago 8, III.



ASK FOR NEW CATALOG A-50

AUTOMATIC PRESSURE, FLOW, AND LIQUID LEVEL CONTROLS





COAL and ASH HANDLING INSTALLATION Philo. Div., YALE & TOWNE MANUFACTURING CO. BEAUMONT

Here's one of the many efficient coal and ash handling installations—designed, manufactured, installed by Beaumont. The above system is operating at the Philadelphia plant of Yale & Towne Manufacturing Company. This plant saved both time and expense—through onecontract-economy . . . But you're right! It's up to us to convince you of the advantages in a Beaumont installation: So let us send you our folder of typical installations. Write to:



DESIGNERS - MANUFACTURERS - ERECTORS BULK MATERIAL HANDLING SYSTEMS

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arch tiles is suspended from a tube which in turn is supported from the overhead framework by adjustable I or U bolts. The beams of the framework can be variably spaced without requiring a single special shape of refractory or casting.

The contours of this arch can be changed to meet new requirements by the bending of a tube and adjusting an I or U bolt. The patented horizontal refractory "8" lock between the upper and lower refractories is said to prevent the tiles from becoming outwardly disengaged.

Normally, the upper tiles are made of high tensile strength No. 1 quality refractories. The lower tiles are made of any grade of refractories required by the service encountered.

### Water Softener

COCHRANE CORPORATION,
17th St. and Allegheny
Ave., Philadelphia 32, Pa.,
has announced a small zeolite water
softener for small boiler and industrial plants where the requirements
may be under 100 gpm.

Designed for low initial cost, simplicity of operation, and for low cost of chemicals used, the Junior Industrial Zeolite Softener is supplied in two groups and in single and double units, to meet practically all require-



# For low cost temperature control the long life insulation PC FOAMGLAS THESE PIPE LINES, operating from 40°F, to 180°F, are being insulated with preformed sec-

ONLY in PC Foamglas do you find the unique combination of properties which makes it such an effective and economical insulation for all sorts of applications.

tions of PC Founglas. This efficient, long lusting insulation is also available in standard flat blocks, curved segments and beveled last to fit many types of processing equipment. Photo: Wire Building, Washington, D.C., Architect: Albin Aubinor.

Over the years Foamglas has proved its ability to furnish long lasting, efficient aid in maintaining desired temperature levels, when installed on indoor and outdoor piping for heating, cooling and processing systems . . . on tanks, towers and other equipment.

That's because Foamglas is a cellular glass material which effectively retards heat travel wherever it is used. Because of its exceptionally high resistance to moisture, vapor and many other destructive elements. Foamglas retains its original insulating efficiency. Because of consequent freedom from repairs, maintenance and replacement, Foamglas keeps insulating costs at low levels.

The next time you figure on insulation, figure on the unusually effective material whose long years of satisfactory service make for truly economical insulation—PC Foamglas.

You can get complete, up-to-date information on Foamglas in our current booklet. Just send in the coupon and we shall be glad to mail you a *free* copy —and a sample of the material.

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The entire strong, rigid block is composed of millions of sected gloss structure, which has unusually high resistance to moisture, vapor and acid atmosphere, is nancombustible, vermineroof and addriess. In those closed gloss cells, which contain still air, lies the secret of the material's long life invaliding efficiently.



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# FOAMGLAS INSULATION

When you insulate with FOAMGLAS... the insulation lasts!

ments. Group I comes in 12", 18", 24", and 30" tank diameter; and Group II in 36", 42", and 48" tank diameter.

The single unit is recommended if a storage tank for softened water is available which can be used while the softener is being backwashed and regenerated (about 45 minutes). The single unit may also be used if the supply of softened water can be interrupted during backwash and regeneration, or if raw water may be used temporarily during this period.

If this is not possible and a continuous supply of softened water is mandatory, the manufacturer recommends the double unit softener.

Various types of zeolite—high and low exchange green sand, synthetic gel, and resinous—are offered, making the softener readily adaptable to different water supplies and periods between regeneration.

# New Foundry Hook

L-24

AMERICAN CHAIN & CABLE COMPANY, INC., York,
Pa., announces a new hook made especially for trunions and other foun-



dry uses. It does away with the necessity of making hooks by hand. The new ACCO Foundry Hooks are stress engineered. Hooks are forged into a round at the point for easy insertion in holes in castings. These new Foundry Hooks are furnished only as an integral part of complete ACCO Endweldur Registered Sling Chains.

# Air Impact Tools

L-25

INGERSOLL-RAND COMPANY,
11 Broadway, New York,
N. Y., announces two new
air operated impact tools. The Size
504 is for nut running up to 34" bolt

size, and Size 510 is for nut running up to 34" bolt size.

Both tools are of the pistol grip type. The reverse caps are deeply grooved for convenient handling. The manufacturer states that emphasis has been placed on scientific muffling to lower operator fatigue and for safety. Both tools have a high run-down speed before impacting starts. Small vane type air motors are said to give all the speed and power needed to handle difficult nut running jobs.

The Size 510 Impactool is designed for one-hand operation. It weighs 11¼ pounds and measures 10% inches long.

Size 504 is a completely redesigned tool, with improved muffling. It may be used for multipurpose operation in drilling up to \$4" diameter or step drilling up to \$4", reaming up to \$6" diameter, tapping up to \$6" diameter, driving screws up to \$6" machine or number 20 wood, hole sawing in sheet metal up to 2" diameter, broken stud and cap screw removal up to \$6", driving and removing \$4" studs, masonry drilling up to \$6", and running wire brushes up to \$6", and running wire brushes up to \$6", and running wire brushes up to \$6" shalk size. The new size 504 weighs \$5\frac{1}{4}\$ pounds and is \$6\frac{1}{4}\$".

# HIGHER EFFICIENCIES ...



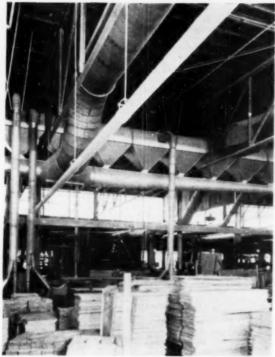
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# HOW TO MAINTAIN INDUSTRIAL CONTROLS

This three article series, which appeared in the May, June, and July issues of SP&I, is now available in a 12 page reprint.

Extensive Check-Charts and data, prepared by W. P. Patrick. Control Division of the General Electric Company, discuss:

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Permits easy relocation of woodworking machinery

One of the ever-present problems in many furniture plants is to rearrange machinery without overloading or un-balancing the dust collection system. That prob-lem is eliminated with the "Plenum Main" Dust Control System. The Plenum Main permits relocation of machinery at will and permits the ready addition of extra fan capacity when needed.

The photo shows a typical installation as designed, fabricated and installed in a large Southern furniture factory. A Liberty Engineering representative will be glad to show you how the Plenum Main will eliminate many dust control problems in your plant.



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High grade gas, by-product, steam and household stoker coal from Wise County, Virginia, on the Interstate Railroad.



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# ADAM COOKS SONS. 2 Mere of Albany Laborating Products LINDEN, NEW JESSEY

Gas Torch

L-26
Rochester, N. Y., has recently introduced the new LP (Liquefied Petroleum) Gas Torch. The unit is portable, instant lighting, and burns in both cold and warm temperatures. It is equipped with interchangeable burners designed to suit special needs.



The Pencil Flame Burner produces a fine, intensely hot flame that is instantly adjustable from pinpoint size to a 2-in. length inner cone. The Utility Burner gives an intensely hot brush type flame adjustable from 2 inches to 4 inches. The calculated flame temperature for both burners is 3660 F.

The torch burns in any position, including upside down. It is designed to operate with propane fuel. One cylinder refill of fuel will economically operate the torch for 12 hours or more, depending on the size flame used.

Flame Failure Safeguard

COMBUSTION CONTROL CORL-27 PORATION, 77 Broadway,
Cambridge 42, Mass., has
introduced to the oil burner field
Fireye Photoelectric Flame Failure
Safeguard System FF-3 for the protection of manually ignited and
semi-automatic industrial oil burners. When flame fails, the unit instantly cuts off fuel and can be
wired to sound an alarm.

The equipment consists of a scanner, housed in an aluminum case and containing the entire electronic system, and a control housed in a steel case containing power supply and relay system. The latter has a safety start circuit to prevent the

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burner from cycling if flame is detected or simulated prior to ignition.

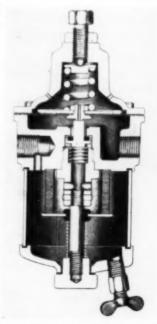
According to the manufacturer.

According to the manufacturer, Fireye incorporates features designed for ease of installation, adaptability to all burner heads, immunity to moisture and electrical leakage, and protection from combustion by-products.

# Regulator-Filter

ches to 4 inches. The calculated ame temperature for both burners 3660 F.

The torch burns in any position, The torch burns in any position, a combination of regulator, which is a combination of regulator,



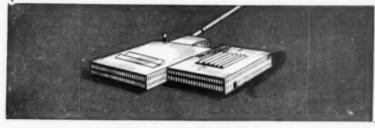
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PLASTIC LINING USED IN PLACE OF FIRE BRICK Boiler furnaces lined with CARECO last two to four times longer than those lined with fire brick. Write for quotation.

CAROLINA REFRACTORIES COMPANY

# BUILT AND BACKED BY BROWNELL

This is the Brownell Type "C" wormfeed stoker, Every detail of its construction reveals the knowledge and integrity for which the Brownell name is famous.

The transmission is a husky, precision-built mechanism with 3-speed anti-clash gearshift, automatic safety stop switch, and thorough lubrication. The hopper is heavy, corrosion-resisting sheet metal on a steel plate base. The feed worm is cast alloy steel. The furnace ironwork consists of heavy, air-cooled sectional tuyeres and dead-plates or side-dump grates.

A gas-repellant valve prevents blow-back of smoke and fumes. Automatic air volume control is optional at extra price. Eleven sizes are available with ratings of 45 to 258 boiler h.p. Ask for fully descriptive bulletin and data.

# THE BROWNELL COMPANY

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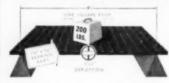
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Tri-Lok is also available in Diagonal, or Super-Safety U-type Flooring, and in Stair Treads of all types. Write for Bulletin KN 1140.

The Tri-Lok Company is also equipped to furnish riveted and Tri-Forge welded open steel flooring. Tri-Lok can be furnished in a variety of metals, including aluminum alloy, stainless steel, etc.

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National Distributor for the Tri-Lok Company

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filter, and dripwell, in a single compact unit.

Constructed entirely of brass and stainless steel, the new unit is said to provide maximum resistance to corrosion atmospheres frequently encountered in industrial processing plants and around seaboard areas.

Filter medium is phenolic resin impregnated cellulose capable of removing oil and water and particles down to 40 microns. Three ¼" taps permit multiple reduced pressure connections and integral pressure gauge mounting. Airpak is available in reduced pressure ranges from 0-25, 0-50, 0-125 psig.

The equipment is suitable for such applications as packaging machines, gauging equipment, air brushes, paint spray machines, laboratory equipment, automatic control instruments, and other equipment using air.

# CATALOGS AND BULLETINS

These free and helpful booklets are available for the asking. Circle numbers desired on the page 17 service coupon post card.

B-IO ADHESIVES—Catalog Section 9160, 8 pages—Table lists adhesives by number, materials for which each is recommended, and method by which most effective bond is created. Color, drying time, weight per gallon, total solids and thinner used, and specifications each meets are included.—THE B. F. GOODRICH COMPANY, Akron, Ohio,

B-II INDUSTRIAL ENGINES—Bulletins
JS Atmospheric Diesel and Atmospheric Gas
engines are described. Standard equipment;
specifications; weights and shipping information; and space plans are included.—THE
COOPER-BESSEMER CORPORATION, Mt.
Vernon, Ohio.

B-12 AIR RELIEF TRAPS—Bulletin No. 206, 2 pages—Describes typical applications for ball float traps for venting the from any liquid pressure vice lines; water heating years, and the pressure vice lines; water heating years, centrifugal pumps; gasoline lines; dry cleaning solvent filters, Include hookup diagrams, sectional drawings, list prices.—ARMSTRONG MACHINE WORKS, Three Rivers, Mich.

B-13 TURBINE PUMPS—Bulletin SCP-50, 16 pages—"Layne Short Coupled Service Pumps" contains cut-away drawings of pump bowls and discharge column; sketches show application to river and re-lift service, boosting; recirculation; cooling tower; drainage; gas and oil pumping, and fire pumps—LAYNE & BOWLER, INC., Mempits Tenn.

B-14 METERING — Booklet, 16 pages — wasse the meter engineering of discusses the meter engineering services of Commonwealth Services, Inc., for measurement and control of electric energy at the point of sale. Test equipment is illustrated with photographs, — COMMONWEALTH SERVICES, INC., 29 Pine St., New York 5, N. Y.

B-15 MATERIALS HANDLING—Certified how a specific plant reduced terminal storage and saved time in loading and unloading materials. Hustrated with actual photographs of operations and with line drawings to compare methods—TOWMOTOR CORPORATION, 1226 East 152nd St. Cleveland.

B-16 RECORDING GAUGE — Bulletin G621, 32 pages—Gives data on pressure gaiges for ranges from 0 to 2 inches of water to 0 to 10,000 psi, vacuum gauges, low range draft and pressure gauges, barometers, and absolute pressure gauges for ranges as low as 0 to 6 mm of mercary absolute—THE BRISTOL COMPANY, Waterbury 20.

B-17 CONDULETS — Catalog 3100, 167 pages — Catalogs condulets with information on plura and receptacles, panel-boards, lighting fixtures, industrial control,

for hazardous and non-hazardous locations. Illustration of each item, catalog numbers, sizes, and prices are given.—CROUSE-HINDS COMPANY, Syracuse I. N. Y.

B-IS AIR FILTERS—Bulletin describes equipment for removal of water, oil and ptpe scale from compressed air systems. Includes tables of prices and dimensions and table for determining how much entrained water is hampering efficiency of air distribution systems.—R. P. ADAMS CO., INC., 225 East Park Drive, Buffale 17, N. Y.

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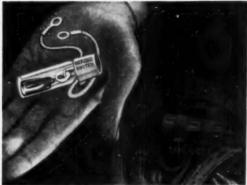
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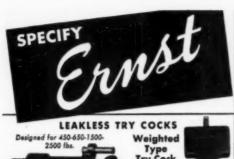
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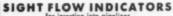
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Fig. 17-28



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Fig. 37



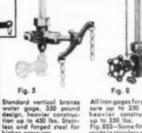
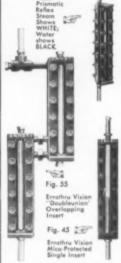


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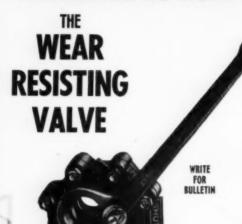
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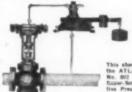
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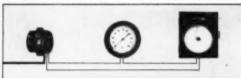
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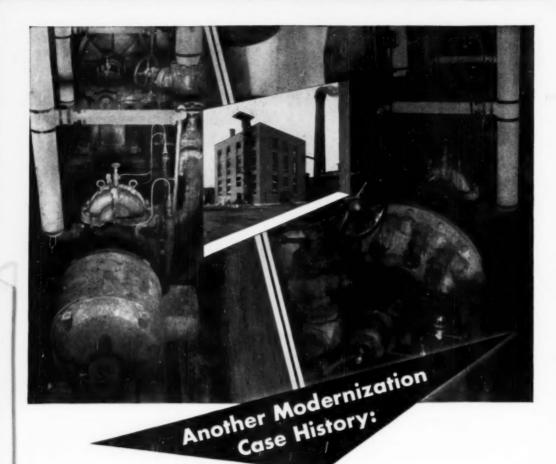
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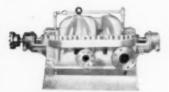
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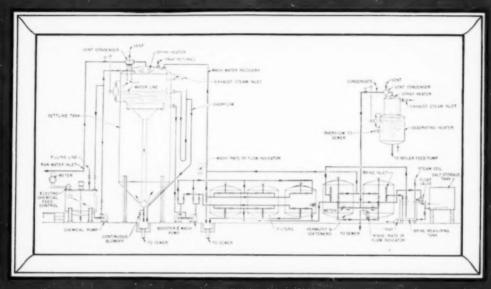
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